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The left half of the above picture portrays the original vase. The right half represents its duplication.

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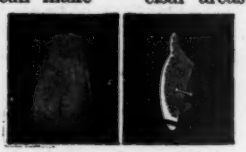

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THE DEVELOPMENT OF ACRYLIC EYE PROSTHESIS AT THE NATIONAL NAVAL MEDICAL CENTER

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A recent editorial[1] stated that little of permanent good comes out of wars and that, to many, medicine is apparently a forlorn loser. But only during a state of war can certain phases of medicine progress.

Paramount among these advances is the Navy's pioneering in acrylic eye prosthesis. These statements supplemented the first article[2] describing a definite technic for eye replacement by acrylic prosthesis written and published by military authors.

The activating factors in the development of an adequate eye replacement by acrylic prosthesis are therefore timely and of great import. While there were undoubtedly previous eye casualties, they were not presented here for restoration until the early spring of 1944. Most of these replacements were made with the glass eye of orthodox design. Few patients were wearing their prostheses since they had been accidentally broken, had exploded in the eye socket or were so etched by eye secretions that they irritated the tissues. Also, many patients were wearing black patches over the eye socket, their explanation being that they would rather acknowledge an eye loss or a diseased eye condition than subject themselves to the readily obvious imperfections of inadequate restorations. (Fig. 1.) Embarrassment necessitated a delay in return of the individual to previous whole or partial military duty or to normal civilian pursuits.

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§Lieutenant Commander (DC) USNR; plastic materials, Naval Dental School.

1. Zieman, Stephen: Acrylic Ocular Prosthesis. Naval M. Bull. 43:1258, December 1944.

2. Murphey, P. J., and Schlossberg, Leon: Eye Replacement by Acrylic Maxillofacial Prosthesis. Naval M. Bull. 43:1085, December 1944.

The opinions or assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large. (Art. 113[2] U. S. Navy Regulations.)

Fig. 1.—Inadequate restoration.

Necessity for Scientific Evaluation

In the first cases presented, the patients were flown from war theaters in the African, Italian and Normandy campaigns. Most of the casualties were the result of violent injury and could not be classified with the cases of purposeful evisceration or enucleation usually presented by civilian noncombatants.

The patients were admitted to the Naval Hospital at the National Naval Medical Center, Bethesda, Md., and were assigned to the eye, ear, nose and throat clinic. Here, they received further treatment, with removal of flak, shell fragments and other foreign objects.

On the completion of this therapy, the senior eye medical officer, Capt. R. T. Canon (MC) USNR, discussed the possibility of eye replacement with his eye medical officer, Arno E. Town (MC) USNR. It was decided to request the cooperation of the U. S. Naval Dental School because of the background in prosthesis possessed by dental officers.

Some months earlier, the creation of a department of maxillofacial prosthesis had been proposed by one of the officers, who had been encouraged by the commanding officer of the Naval Dental School, when he served as executive officer, to initiate preliminary investigation and adaptation of his previous civilian experience to military types of injuries. Therefore, a substantial beginning had been made before the organization of the department.

The senior medical and eye medical officer of the eye, ear, nose and throat clinic of the Navy Hospital thereupon requested, through the medical officer in command of the Naval Hospital, Capt. John Harper (MC) USN, the development of an adequate eye replacement service by the U. S. Naval Dental School. The dental officer in command therefore established a separate department of maxillofacial prosthesis and the officer originally proposing the department was

named officer in charge, in addition to his other duties. The cooperation of the officer-in-charge of the medical illustration division of the Naval Medical School was requested, inasmuch as it was immediately realized that his services were essential, because of his anatomic training.

An extensive search of all published material on all types of eye restorations was begun with a view to evaluating previous concepts of various authors. Simultaneously, cases were started with an actual application of known prosthetic principles. Even though it had been rumored that eye prosthesis was possible with acrylic materials, an exhaustive survey of available articles at the time clinical work was begun did not disclose detailed articles on the construction of acrylic eye prostheses and few articles on any type of eye replacement. A scientific hypothesis for the present structure of glass eye replacements was notably lacking.

Early Artistic Background of Previous Prostheses

Artificial-eye making became a profession in Roman times with the designation of *faber ocularis,* found in inscriptions with mention of the eye physician as *medicus ocularis.* The youthful bust of Caligula, which can be seen in the Metropolitan Museum of New York, is made of bronze and has eyes of dark blue glass set in ivory.

Mittwoch[3] quotes this passage from the Talmud Jeruschalmi published 4 B. C. "He took into his house a girl, made her an eye of gold, a tooth of gold, and then gave her as wife to the man." Of interest in our time is the further mention that the Egyptians[4, 5, 6] were familiar with the manufacture of artificial teeth and the assumption can be made that these same artisans also made artificial eyes for cosmetic improvement.

Paré[7] (1561) has been given the credit by many authorities for being the first person to write of the use of artificial eyes in the human body, and he spoke as though it were common in his work.

The early background of eye prosthesis is almost wholly in the field of art. Notable among other authors found is Hirschberg,[8] who emphasizes the necessity for artistic conception and color appreciation and stresses the aid that eye prosthesis gives to more lifelike reproduction.

Eye Prosthesis in America

Eye prosthesis began in America in 1851, when Pierre Gougelman,[9] a native of Switzerland, started making shell eyes of glass in New York. He had served as interpreter for Boissonneau in Paris and learned the "trade" from him. In 1890, Snellen, of Germany, produced the "reformed eye," and these were shipped here as stock eyes, both finished and partially complete. The Gougelman family did not make any known contribution to the literature during this period of ninety years; but, in 1941, Paul Gougelman wrote his article on the "Artificial Eye Industry in America" in response to a publication by Dimitry.[10] The article by Gougelman deals princi-

3. Mittwoch, E.: Ist das kunstliche Auge schon im Talmud erwahnt? Mitt. z. Gesellsch. d. Med. u. d. Naturwissensch 6:514, 1907.

4. Pergens, E.: Bertrag zur Geschichte der Kunstaugen. Centralbl. f. prakt. Augenh. 20: 121, 1896.

5. Bruce, G. M.: Ancient Origins of Artificial Eyes. Ann. M. Hist. 2:1, January 1940.

6. Pergens, E.: Ueber Kunstaugen aus Alt-Meilks und bei einigen andren Volkern. Centralbl. f. prakt. Augenh. 30:359, 1906.

7. Paré, Ambroise: Oeuvres, Paris. 1604, p. 837.

8. Hirschberg, J.: Geschichte der Augen heilkund. (Zusaz.) Geschichte und Literatur des kunstlichen Auges. Handb. d. ges. Augenh. (Graefe-Saemisch) 14:189, 1911.

9. Gougelman, Paul: Artificial Eye Industry in America. Eye, Ear, Nose & Throat Month. 21:308, November 1941.

10. Dimitry, T. J.: Story of Artificial Eye. Eye, Ear, Nose & Throat Month. 21:270, October 1941.

pally with the history of his family. Even though it is hard to understand why disclosures were not made for the benefit of scientific advancement in this field, one cannot but admire the close spirit of family cooperation that persisted for such a long period of time. Worthy of observation is this quotation: "Of 125,000 eyes that we have on hand, I make the positive statement that no two natural eyes and sockets are alike."

T. J. Davis, in 1863,[11] published the only available article on artificial human eyes known in the nineteenth century. Thomas James practiced with Albert H. Davis, his brother, in New York during Gougelman's time, and Gougelman credits him with "doing some very fine work with a high class clientele." Their article does not describe any technic of manufacture.

F. J. Dimitry[12] mentions that between one-quarter and one-half million people in the United States wear artificial eyes and that these are made by seven firms employing twenty-seven artisans. A minimum of twenty eyes are needed for the poorest selection, and some firms stock between 50,000 and 135,000 eyes.

Other authors were A. G. Holmes,[13] who suggested an acrylic sclera for temporary use immediately after loss of the eye. W. Nordlow[14] described the insertion of a plastic piece in the socket to form the inner fornix of the lower lid only. N. N. Priorov,[15] of Russia, also suggested the use of a temporary prosthesis of flat form with a hole in the center to avoid contracture of the ocular cavity after surgical operations. Penn and his co-workers described a plastic eye in connection with an article on "problems in eyelid and socket reconstruction," but did not go into the details of construction.

Need for an Original Technic

From this survey, it became evident that an original technic was necessary in order to develop an adequate prosthesis. Such a restoration would have as its objective the normal contour of the face, and would be functional in movement, and accurate in duplication of color and light-reflecting properties in order to assure an esthetic result.

The operator should be as familiar with the anatomy of the eye and eye socket contents as he is with the anatomic considerations involved in full denture prosthesis. A working model was made of the extrinsic muscles of the eye and their action carefully studied. The principal muscle to be accommodated was the levator of the upper lid. Previous artisans did not seem to consider the possibility of contraction or loss of muscle tone following evisceration or enucleation.

Restorations were made on the premise that since the normal eye was globular, the replacement should likewise be spherical. A careful assessment of the factors involved tends to discredit this reasoning. The prosthesis, in addition to restoring the shield between the palpebrae, must have the more important function of replacing lost portions of tissues within the socket, so that normal facial contours are approximated. In traumatic injuries, the necessity for a complete replacement is apparent. If the patient has worn previous types of prostheses, it is even more evident because of the typical changes caused by contracture and atrophy of the levator muscle, which does not have the opportunity for function that it needs to sustain vigor.

In Figure 2, the relationship of the

11. Davis, T. J.: Treatise on Artificial Human Eyes. New York, 1863.

12. Dimitry, T. J.: Plastic Artificial Eye. J. Louisiana U. School Med. 4:8, April 1943.

13. Holmes, A. G.: Use of Acrylic Resin in Construction of Temporary Artificial Eyes. D. Bull. (Supp. to Army's Bull.) 12:265, October 1941.

14. Nordlow, W.: Fornixplastik for ogonprotes. Nord. med. 4:2010, 1940.

15. Priorov, N. N.: Enlarged Ocular Prostheses and Their Use. (Abstr.) Im. Rev. Soviet Med. 2:70, October 1944.

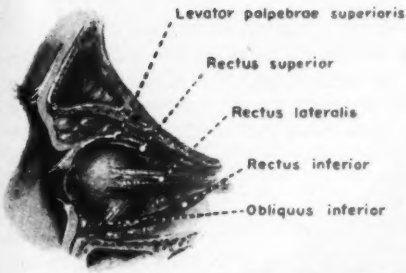

Fig. 2.—Vertical section through normal orbital cavity.

extrinsic eye muscles to the normal functional eye is shown. The fatty tissues in the eye socket can be readily visualized.

After the partial loss of the viscera of the eye through evisceration, the eye organ contracts because it has lost that portion of its bulk which enables it to maintain a globular form in normal health.

The extra-ocular muscles also contract and are absorbed by the posterior wall tissues of the eye socket. Under these conditions, the prosthesis cannot possibly assume the original form of the eye organ. It not only must occupy the depleted space, but should also serve to replace those areas in which fatty tissues have been absorbed from lack of function, or other areas lost by those destructive processes which made evisceration necessary. Figure 3 portrays the anatomic structures to be considered under these conditions.

A large majority of cases following war casualties are presented for ocular prosthesis after enucleation of the eye. These cases may or may not have implants in Tenon's capsule, and many have suffered damage to tissue within the socket and to the palpebrae. Under these conditions, the prosthesis cannot have the form of the original organ because the restoration should replace all possible lost portions of the eye socket. Normality of facial contours should be coordinated with the maximum palpebrae function obtainable. Figure 4, a vertical section, depicts such a condition.

Individual Eye Prosthesis

Because each case presents an individual problem, it became evident that an impression of the eye socket and area was necessary. The orthodox method of selecting an eye prosthesis from a large stock of eyes on hand was as incongruous as selecting a denture prosthesis from a large collection of dentures. Yet, generally speaking, this has been the method of eye selection in America for ninety years, even though one of the members of the "trade" made "the positive statement that no two natural eyes and sockets are alike."[9]

Certainly these facts become more evident with the experience gained in additional cases. Particularly is this true of the structure of the prosthesis that is determined by the shape of the eye socket. An adequate impression technic therefore must copy all the structures contained in the eye socket. The back wall in static position will synchronize with the corresponding eye in lateral and horizontal position. Furthermore, it must also duplicate the position of the palpebrae in relation to the back wall of the socket. It should register the

Fig. 3.—Vertical section after evisceration.

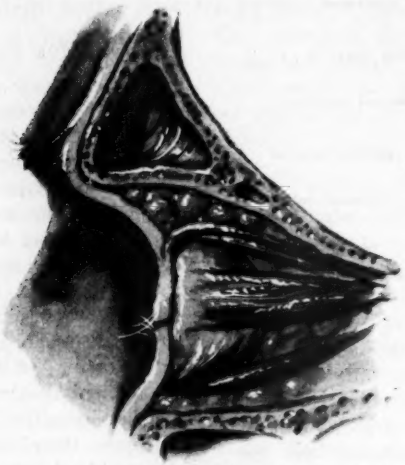

FIG. 4.—Vertical section following enucleation.

greatest extent of the superior and the inferior fornix of the palpebrae, to determine the peripheral extent of the prosthesis, similarly to the peripheral muscular outline in denture construction. With these requirements, any technic designed to take an impression of the inner portion of the eye socket alone would seem inadequate.

The method for duplication of the eye socket area has, as originally described,[2] proved most effective. It is used by other dental officers who have been subsequently trained in the technic.

Furthermore, the making of a cast of the socket gives a record of the case when the first prosthesis is made. It records any changes that may be necessary during the progressive periods of growth or other changes in the orbital area.

It is analogous to a properly oriented study cast clinically interpreted in orthodontic correction.

Photographic Interpretation

The physical three-dimension recording in the working cast is necessary for a photographic recording and orientation. The photographing of the eye in actual size, the use of front view and profile photographs and the recording of finished results in color were made possible by the cooperation of the photographic department, Ensign H. F. A. Long, officer-in-charge, of the Naval Medical School, which cooperates closely with the maxillofacial prosthesis department of the Naval Dental School.

The initial photographs provide accurate anatomic guides. The iris of the existing eye can be definitely measured for diameter and the distance from the inner and the outer canthus of the palpebral fissure determined. The opening of the eyelids is recorded so that, in the replacement, it may be simulated. The palpebral sulcus in the superior and inferior lids and the size of the orbital and tarsal portions may also be measured, so that these areas may be reproduced in the replacement.

The most valuable adjunct in evaluating the result of the replacement is a color comparison, by means of a well-done kodachrome photograph.

The Eye Pattern

From the working cast, it is possible to obtain an accurate replica in wax

of the area within the socket. On removal of this pattern from the working cast, it is evident that few sockets give a globular pattern. The marked variations in these patterns are most noticeable in three selected types, shown in Figure 5.

These patterns do not present any known previous structure. In order to restore the lost contour of the face, additions are made to the wax pattern as shown in Figure 6.

The amount of additional wax needed varies in each case, depending on what is desired. The pattern is then tried in the eye socket to determine its adequacy in regards to contour and degree of mobility. (Fig. 6.) There is actually simulated movement with this pattern. The extrinsic muscles have surface areas to work on, which aid in the development of muscle vigor and function. It would be impossible to depict all standard types of wax patterns because no two are alike in size or shape. The general rule of making an addition to the wax pattern in the fornix area in the lower lid anteriorly and inferiorly will usually apply.

The pattern when completed may be expected to function in a manner similar to that of the finished prosthesis. Time spent in molding and contouring to final form is well expended. Experience will familiarize the operator with the desired form. The pattern is then removed from the eye socket, sprued and invested in an injection type flask for duplication in acrylic.

Clinical Use of an Artist and Medical Illustration

The earlier *faber ocularis* was also the maker of artificial teeth. So also was the making of eyes associated with art. Expression is found in the Aztec, Inca and Egyptian mummies and in Greek and Roman statuary.[4, 5, 6] The collaboration of an adequately trained illustrator is a definite aid to an eye replacement that duplicates the color and the anatomic characteristics of the natural eye. An individual with artistic sense and a general art background is adaptable to training in the color duplication used in maxillofacial prosthesis. Landscapes and still and life paintings are, generally speaking, quite gross. In this work, it is necessary to convey all the fine anatomic minute details and the form of each anatomic part, together with a du-

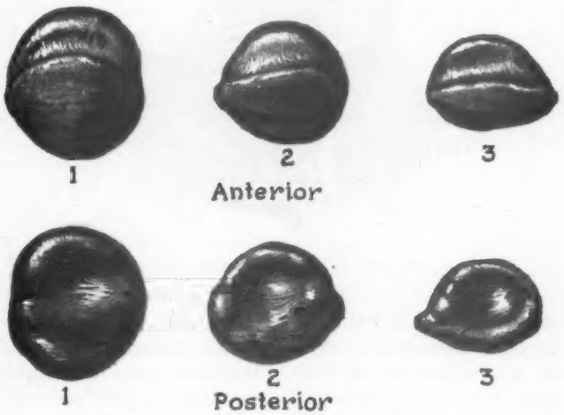

Fig. 5.—Variation in socket pattern form.

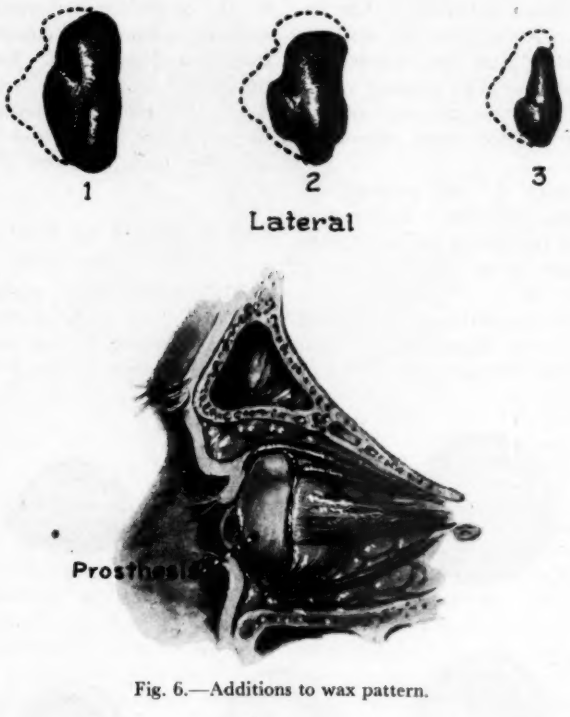

Fig. 6.—Additions to wax pattern.

plication of the color found in living tissue. This requires painstaking observation and the application of the illustrators' conception to color reproduction. Experience will augment the artist's skill and make possible the rapid production of color and detail replicas.

Because of the fine differentiation of color in human tissues, the competent illustrator is best fitted to aid in the selection of the scleral and iris colors. Furthermore, with the dentist working with him, a check is possible on individual conceptions of color values. This is essential because eye restorations are subject to constant scrutiny in conversation or daily routine.

The first scleral portions were cured from clear acrylic to which had been added titanium oxide to obtain opacity and the desired whitish background. The three basic colors, red, blue and yellow, in powder form, were added until the desired color tint was obtained. Liquid monomer was then added to a small quantity of this mix as a sample and cured in typical scleral form. They were then used as a shade guide for the selection of a basic scleral color.

The sclera, after it is cured and invested, ready for the reception of the iris, may be tinted to match the existing eye. The artist blends the blue, about one-eighth to one-fourth inch around the iris margin, into a yellowish orange and into a vermilion tinge in the peripheral areas. Blood vessels drawn into this area may duplicate in size those of the other eye.

This variation in size and pattern is accomplished by using a pen point and etching ink to accentuate artistically any individual characteristic. The slightest deviation from true color value is im-

mediately perceptible, even on casual observation.

Duplication of the Iris and the Pupil

During the curing of the acrylic sclera, the artist duplicates the iris and the pupil. The photographs are studied and the size of the iris is determined, 1 mm. being allowed for enlargement due to magnification produced by the clear acrylic of the cornea area. It has been found that the iris will vary between 10.5 and 12 mm. The rule for the size of the pupil is that its diameter should be approximately one-third that of the iris when a single restoration is made for a patient. A smaller pupil may be made for day use and a larger pupil for night wear in two different eye restorations.

The painting of the iris and pupil is done on a good quality white smooth watercolor paper, outlining the pupil in black India ink. The shades are mixed from the primary colors on a palette and, when the color matches the existing eye, the painting is begun. Very often, lines radiating from the pupil are introduced as needed to copy detail, and any flecks of color are spotted in to simulate the colors of the existing iris. Magnifying lenses are used to enlarge minute details, in order to facilitate an accurate reproduction. Enlarged blue and brown irises, as shown in Figure 7, will convey more accurately those details that are essential in the iris replica.

Plastic Materials Used in Eye Prosthesis

As development progressed, the commanding officer of the Naval Dental School requested the duty of a dental officer with previous civilian experience in the chemistry and properties of the organic plastics, who was assigned to duty at the Naval Dental School. The express purpose of this assignment was to carry out work with each dental officer and to survey not only the use of plastic materials in eye prosthesis, but also all types of dental service wherein organic plastics are indicated.

It was observed that prostheses which met all the desired objectives, and which to the average observer were accurate matches in color, when photographed with Kodachrome Type B film recorded exaggerated blues and reds. Scleras appeared bluer than was apparent with the eye and the blues of iris areas in photographs had a greenish tinge.

It was found that the use of titanium oxide was increasing these properties of the acrylic. In photography, the ultraviolet radiations from the material were minimized, producing an exaggerated blue instead of the matching scleral color.

At this point, it was decided to in-

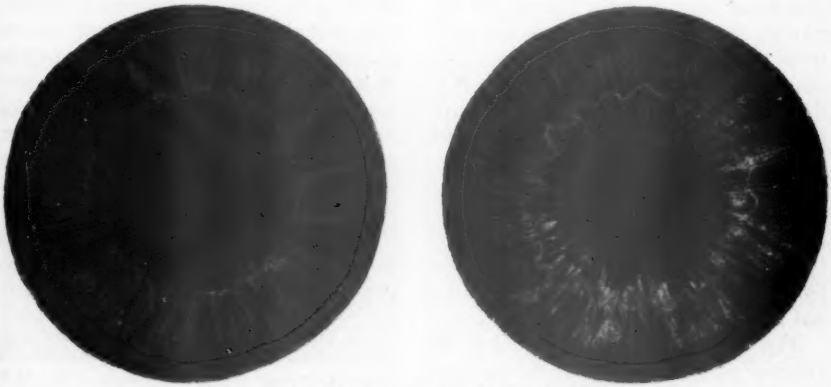

Fig. 7.—Enlarged irises showing duplication details.

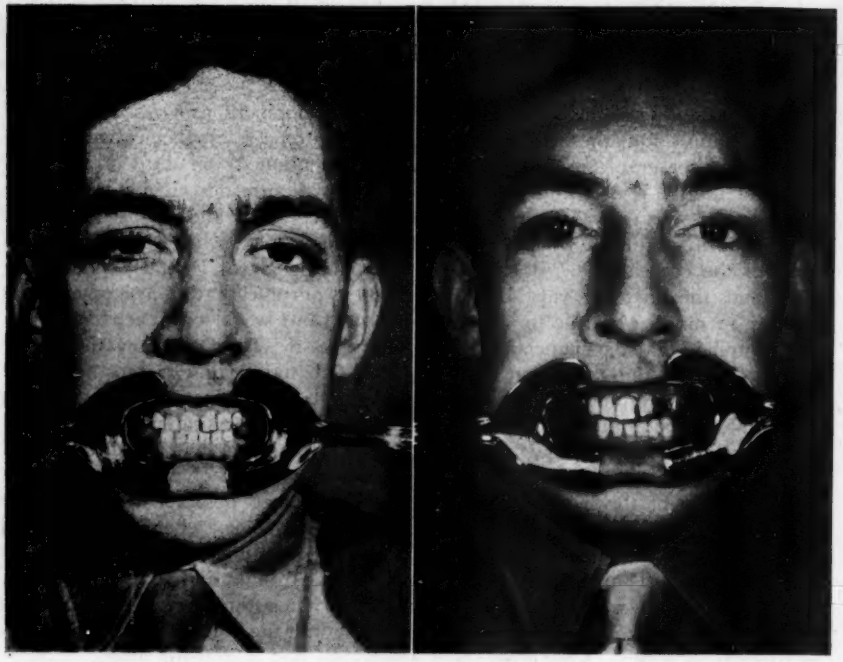

Fig. 8.—Fluorescent eye and nonfluorescent tooth prostheses with (*A*) usual illumination and (*B*) ultraviolet illumination.

duce fluorescence in the materials used.

Fluorescence may be defined as that ability of a substance to absorb and in turn reflect those short waves of color in the spectrum which are visible under ultraviolet light and are not readily discernible by the human eye. In eye prosthesis, this property is imperative. One should have a constant color match in the usually visible prosthesis, under varying environmental light conditions, such as the "bulkhead" or "overhead" colors in rooms, inside and outside light factors of sunshine or light variations on dark and cloudy days. The use of a "black light" or modified ultraviolet light determines whether the restoration has the property, as shown in Figure 8.

The use of a fluorescent agent in the polymer and monomer and the pigments used in coloring the acrylic will impart this important property to the finished prosthesis.

Injection—Polymerization Desirable

A series of tests of scleral patterns were cured, with both compression and injection technics. Most eye prostheses are of sufficient bulk to register contraction or shrinkage of the material during polymerization by the compression method used in denture prosthesis. Furthermore, when these cured scleras were cut open, there was evidence, under magnification, of faulty condensation of the material. Therefore, the usual injection type of flask[16] was used for additional tests, because the eye prosthesis must be dense.

16. Pryor, W. J.: Methods of Producing More Lifelike Dentures, Including Preparation and Processing of Acrylic Resins. J.A.D.A. 28:894, June 1941.

It must resist any action of the eye socket secretions upon its surface.

Because of the bulk of material to be polymerized, maintenance of consistent pressure during the curing process was desirable. For this purpose, the flask is modified with a water jacket for cold water around the injection plunger barrel. This barrel was cut away from the body of the flask and embedded in the investment so that when the upper half was poured, heat would not be transmitted to it so readily. This prevents the sprue from being cured ahead of the mass of the restoration medium. Also, a block of wood was placed in the bottom of the water bath so that the water bath, instead of the flame from the burner, would heat the flask.

Fixation of Colors in the Prosthesis

It is imperative that, in the restoration, all colors remain fast regardless of variations in exposure to natural or artificial light. Accordingly, many tests were made to develop either a fixed color or color fixative. It was determined that water colors on paper had the property of impregnating the substance of the paper and, when properly treated, were fast. A sample of several iris replicas were completed and then cut in half. One half was invested in the scleral material and carried through the complete technic. This specimen was then submitted to the National Bureau of Standards with the request that it be exposed to the equivalent of the natural and artificial light which a patient might experience in a period of ten years. After this, the half of the iris replicas not processed were placed beside the processed replicas. It was not possible to detect any change in color or intensity. The results of this test are shown in Figure 10.

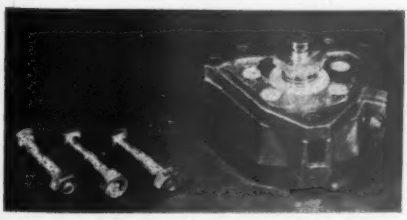

Fig. 9.—Modification of injection type flask.

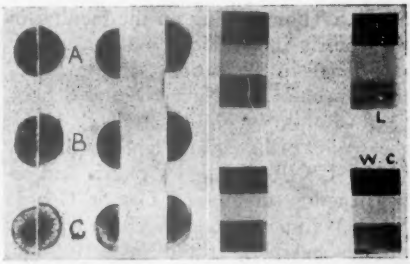

Fig. 10.—Comparison of control and colors exposed to equivalent natural and artificial light.

After these definite tests, it was determined that the iris with the "protective coating" over it could be placed in its insert in the painted sclera. Lacquer colors could be used for the varying tints of color in the sclera, and a special type of etching ink for the blood vessel areas.

With the painting complete, the entire iris and scleral area are coated with an "iris cement," which gives a protective coating of polymerized clear material over all surfaces of the painted prosthesis. The prosthesis is then returned to the flask and clear acrylic is cured over the scleral and corneal areas as described in the original article.[2]

Instruction in Maxillofacial Prosthesis

Because of the results obtained in this technic developed solely at the National Naval Medical Center, a course of instruction was planned for Naval dental officers in maxillofacial prosthesis. The officer-in-charge of the department, under the direction of the commanding officer of the Naval Dental School prepared a syllabus of this course, which has received favorable comment from many dental schools throughout the United

States. Those serving on the faculty for the course, in addition to those officers mentioned in this article, are the executive officer of the Naval Dental School, Capt. Ralph W. Malone (DC) USN; the senior orthopedist, Capt. J. S. Barr (MC) USNR; the senior plastic and reconstruction surgeon, Lt. Comdr. George V. O. Webster (MC) USNR, and senior eye medical officer of the Naval Hospital, Lt. Comdr. R. R. Downey (MC) USNR.

The Naval Medical School under its medical officers in command, Capt. Paul Wilson (MC) USN (to February 1945) and Capt. H. L. Pugh (MC) USN (since February 1945) has cooperated to the fullest extent, and has made possible the training of artists to serve as a team with the Naval dental officer.

A course in illustration as applied to this type of art is given by the officer in charge of the medical illustration division.

The class is trained in the reproduction of the iris and scleral colors and the characteristics of the anatomic eye, and in the color tints of various portions of the face and extremities replaced by prosthetic appliances.

The Prosthetic Appliances Board at the National Naval Medical Center

Owing to the extensive prosthetic restorations at other Naval activities and to this development of eye prosthesis and other types of replacement here, it was deemed advisable to establish a coordinating board for the U. S. Navy. The officer in charge of the Rehabilitation Branch of the Professional Division of the Bureau of Medicine and Surgery, Capt. Howard H. Montgomery (MC) USN, and the medical officer in command of the National Naval Medical Center, Rear Adm. W. Chambers (MC) USN, at the direction of the Surgeon General of the U. S. Navy, Vice Adm. Ross T. McIntire, established this board. It is known as the Prosthetic Appliances Board, with twelve members and a secretary, Lieut. E. R. Stovall (HC) USN.

The object of the board is to coordinate investigations in the applicability and use of all substances and materials which might be used in the development of corrective appliances. Especially considered will be those substances that will mitigate or offset the results of war wounds, as well as those that have as their primary purpose overcoming the handicapping results of trauma. To that end, it will initiate experiments and new projects.

Results Obtained

Because of the many factors involved in modern plastic eye prosthesis, it is difficult to describe all the fine points in a single article. This should be more completely presented in a monograph on the subject. The results of this technic can be adequately determined in color reproductions. Kodachrome stills are made of each completed case, and a few of these duplicated in black and white are presented for observation in Figures 11 and 12.

Summary

1. The Naval dental officers attached to the United States Naval Dental School and the officer in charge of the medical illustration division of the Naval Medical School developed the present successful type of acrylic eye prosthesis.

2. The first published article describing a definite technic for replacement by acrylic prosthesis written by military authors appeared in the *U. S. Naval Medical Bulletin*.[2]

3. Lack of supply and the inadequacies of previous eye prostheses necessitated the development of an adequate restoration for present eye casualties.

4. Naval medical officers attached to the Naval Hospital requested the cooperation of the U. S. Naval Dental School and Naval Medical School in the development of an eye prosthesis and consulted and advised in the technic used

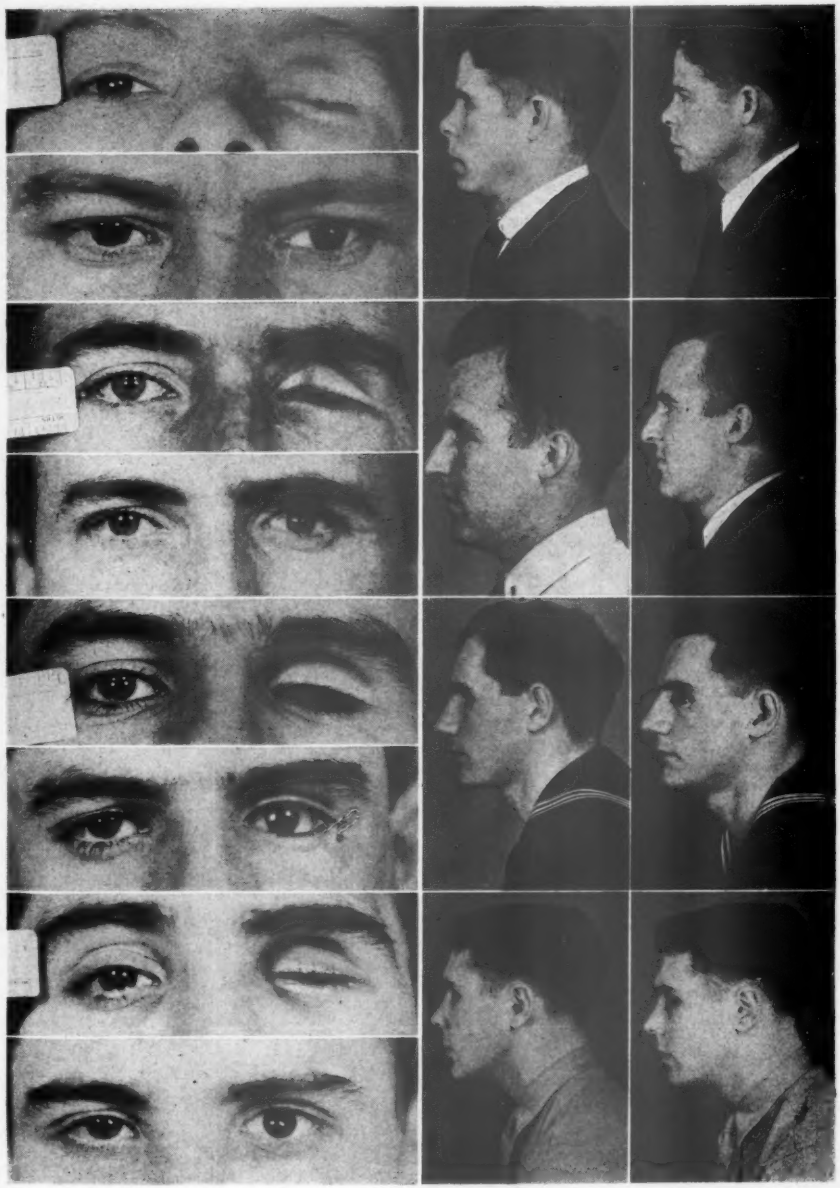

Fig. 11.—Results of ocular prosthesis.

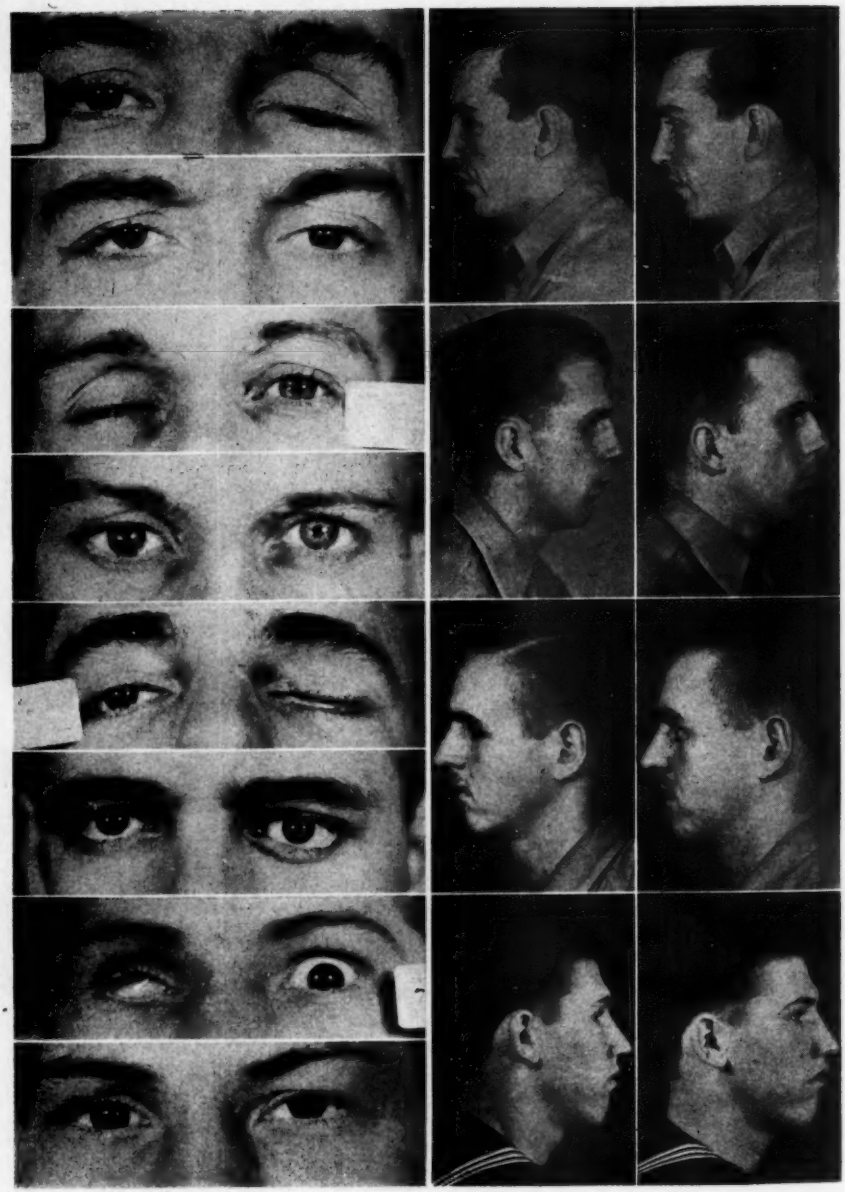

Fig. 12.—Results of ocular prosthesis.

Fig. 13.—Results of ocular prosthesis.

Fig. 14.—Results of ocular prosthesis.

Fig. 15.—Results of ocular prosthesis.

and the results that were obtained.

5. Literature on the subject was very incomplete. It establishes the early origin of *faber ocularis* and his occupation also as the maker of teeth; together with the early association of an artistic background.

6. There are few publications on prosthetic morphology, and none with a complete description of technic or an hypothesis.

7. An original technic is therefore imperative, with anatomic considerations emphasizing necessity for an individual eye prosthesis, from an impression of the eye socket and the area from which a wax pattern is made.

8. An illustration by a trained person is the most effective means of reproducing exact anatomic replicas of the iris and in scleral areas which match in color values and in light reflecting properties.

9. Organic plastic materials should have fluorescent properties and be constantly polymerized by injection methods.

10. Colors used in the prosthesis may be definitely fixed. They are resistant to any changes produced by various light factors, over a period of years.

11. Naval dental officers and hospital corps personnel have been trained in the technic and have had results comparable to those obtained by us.

12. The results obtained are wholly satisfactory to the Naval medical officer. They have given to Naval personnel that restoration of morale essential to return them to normal military and civilian pursuits and reestablish their vocations and ability to get along with relatives and friends.

A NATIONAL DENTAL CARE PROGRAM: PRESENTATION OF THE DENTAL PROBLEM*

John T. Fulton,† D.D.S., Hartford, Conn.

The core of the dental problem centers in the marked disparity between dental needs and dental service. Any effective program, local, state or national, must understand and successfully combat the basic reasons for this imbalance.

The indiscriminate nature of tooth decay defies easy solution. Natural immunity applies to but a small segment of the population, and few measures have succeeded in limiting the disease, the rate at which the teeth succumb to decay being largely a matter of length of exposure to their environment.[1] Furthermore, the inability of the hard dental tissues to repair themselves allows destruction to proceed, the lesion usually increasing in severity as time goes by.

The number of affected teeth follows a consistent curve that rises sharply through childhood, the teens and early adult life, flattens out somewhat in approaching 35 years, but continues to rise slowly as long as teeth are present. Investigation has shown that the average child beginning school has six primary teeth involved in the decay process[2]; the 14-year-old has four carious permanent

*Read before the American Public Health Association, October 3, 1944.

†Chief, Division of Dental Hygiene, Connecticut State Department of Health.

1. Klein, Henry, and Palmer, C. E.: Epidemiology of Dental Caries. University of Pennsylvania Bicentennial Conference, 1940.

2. Klein, Henry; Palmer, C. E., and Knutson, J. W.: Studies on Dental Caries. I. Dental Status and Dental Needs of Elementary School Children. Pub. Health Rep., 53:751-765, May 13, 1938.

teeth[2]; the youth of 18 has developed nine lesions[3]; the person of 25, eighteen, and of 35, twenty, and the 65 years and over group have affected teeth to the number of twenty-four.[4] On the average, the annual increment of new defects involved 1.32 tooth surfaces.[2] While fluoride-bearing waters have apparently changed these rates in certain areas[5] and racial factors have lowered them in others,[1] a great part of our nation conforms to the general picture. Obviously, such a situation indicates that a tremendous volume of need is widespread through the population.

So far, dental science has developed two effective methods for the treatment of tooth decay, filling or extraction. Fillings have stood the test of time as a means of preserving the teeth for long periods of function. While extraction solves an immediate problem, in the long run it creates new needs more complex in character because of the demand for mechanical replacement. At all events, either method requires professional service.

The evidence at hand suggests that annually, on the average, no more than 269 out of every thousand people visit the dentist[6] and that, despite the importance of regularity, the average lapse of time between visits is two and one half years.[7] As tooth decay is very active in children, with defects accumulating at a rapid pace, it has been recognized that "dentistry for children becomes the first weapon of importance against dental diseases . . . on a national scale."[8] Despite this considered professional opinion, it appears that young children get very little service, the bulk of office time being given over to adults.[6, 9] The more preventive services, such as fillings or prophylaxis, reach their peaks in the teen ages, it is true,[6] but the total volume of work does not seem to approach the actual needs. Among children, carious tooth surfaces develop five times faster than they are filled and a "considerable portion of the yearly disparity of teeth is extracted or becomes indicated for extraction" each year.[10] As might be expected, the rates for extraction and mechanical replacement rise sharply in adult groups.[5] One typical study of several hundred young men in the 21-35 age range disclosed nine out of ten needing replacements in the forms of bridges or dentures.[11] Clearly, the present amount of dental service does not meet the needs of the people and, in consequence, a great accumulation of unmet need is spread through the population,

3. Klein, Henry, and Palmer, C. E.: Studies on Dental Caries. IX. Prevalence and Incidence of Dental Caries Experience, Dental Care and Carious Defects Requiring Treatment in High School Children. Pub. Health Rep., 53:1258-1268, July 12, 1940.

4. Hollander, Franklin, and Dunning, J. M.: Study by Age and Sex of Incidence of Dental Caries in Over 12,000 Persons. J. D. Res., 18:43-60, February 1939.

5. Dean, H. T.; Arnold, F. A., and Elvove, E.: Domestic Water and Dental Caries. V. Additional Studies of Relation of Fluoride Domestic Waters to Dental Caries Experience in 4,425 White Children Aged 12 to 14 Years, of Thirteen Cities in Four States. Pub. Health Rep., 57:1155, August 7, 1942.

6. Collins, S. D.: Frequency of Dental Services Among 9,000 Families, Based on Nationwide Periodic Canvasses. 1928-1931. Pub. Health Rep., 54:629-657, April 21, 1939.

7. Walls, R. M.; Lewis, S. R., and Dollar, M. L.: Study of Dental Needs of the Adults in United States. Chicago: American Dental Association, 1940.

8. Oppice, H. W.: Role of Dentistry for Children in National Health Program. J.A. D.A., 29:1691-1696, September 1, 1942.

9. Britten, R. H.: Study of Dental Care in Detroit, Mich. Pub. Health Rep., 53:446-459, March 25, 1938.

10. Klein, Henry, and Palmer, C. E.: Disparity Between Dental Need and Dental Care in School Children of Hagerstown, Md., and Environs. J.A.D.A., 28:1489-1498, September 1941.

11. Klein, Henry: Dental Status and Dental Needs of Young Adult Males, Rejectable or Acceptable for Military Service, According to Selective Service Dental Requirements. Pub. Health Rep., 56:1369-1387, July 4, 1941.

and the longer it continues, the more it increases the complexity of the problem.

Various arguments have been advanced in an attempt to explain this situation. Opinions are freely expressed, but few facts are available. There are undoubtedly certain basic psychologic and physical factors in the problem. Even the highest income and culture groups do not approach 100 per cent dental care.[6]

If every person in the country were informed tomorrow morning that a dental office had been established at the corner of the block, with service obtained for the asking at no charge whatsoever, it is highly improbable that all of them would respond. Plain fear would eliminate many of them. The natural tendency to avoid pain, discomfort or annoyance, which is part and parcel of every human being, plays a definite and important role in the neglect of dental care. Habits also would enter the picture. These are developed and retained, after all, because they fill a definite need.[12] Dental health is not an end in itself, but a means, which must prove its efficiency in obtaining a larger satisfaction. As a case in point, it has been shown by several surveys that women tend to seek dental service more often than men do.[6, 7] These rates for the sexes do not vary much in childhood; but, through the late teens and early adult period, the amount of dental service sought by women definitely rises above that sought by men, not because of a variance in needs, but because of its cosmetic value. Ignorance is certainly a factor. Despite educational efforts, good dental health measures and the values accruing therefrom are still a closed book to many people.[13]

Of greater importance perhaps are certain basic physical aspects of the problem. Dental manpower is a real cause for concern. It has been pointed out[14] that no state or geographic area is oversupplied with dentists and that civilian dentists in the United States are working at, or at very near, capacity.[15] There is further evidence that the present need for service in the whole population would consume many more hours than the available dental manpower could supply.[16] The distribution of dentists in the population adds further complications. It is natural for the areas of higher income to have the greatest number of dentists per unit of population.[14] Professional men can be expected to settle in areas offering the greatest financial and cultural advantages. Tooth decay refuses to be governed by such rules, many less favored sections, although poorly supplied with dentists, being rich with an accumulation of needs. This inequitable distribution of manpower not only is true of geographic districts, but occurs within the boundaries of states as well.

Socio-economic status unquestionably adds to the problem. There is evidence that the volume of dental service is governed more by ability to pay than by actual needs.[6] All service, except extraction and denture, increases greatly as income level rises. The upper income groups visit the dentist more frequently and with greater regularity[7]; which accounts for the fact that the rate of tooth extraction or indicated extraction is significantly higher in low income groups.[17]

12. Maslow, A. H.: Theory of Motivation. Psychol. Rev., 50:370-396, July 1943.

13. Irwin, V. D., and Wilson, N. W.: What Does the Layman Know About Dental Health? J.A.D.A., 30:1088-1091, July 1, 1943.

14. O'Rourke, J. T.: Analysis of Number and Distribution of Active Dentists in United States. J.A.D.A., 31:1097-1110, August 1, 1944.

15. Klein, Henry: Civilian Dentistry in Wartime. J.A.D.A., 31:648-661, May 1, 1944.

16. Klein, Henry: Dental Needs Versus Dental Manpower. J.A.D.A., 31:263-266, February 1, 1944

17. Klein, Henry: Tooth Mortality and Socio-Economic Status—Life Tables for Teeth. J.A.D.A., 30:80-95, January 1, 1943.

Dental care in the form of fillings is inversely correlated with loss and extraction of teeth, and the volume of dental care as fillings increases markedly with increase in economic status.[18]

One authority has stated that "the true need for dental service in the whole population can be estimated by applying to the general population the rate at which dental service is obtained by persons in the higher socio-economic groups."[16]

A national dental care program, then, must face the problem of balancing dental services with a great volume of accumulated need, which is enlarged each year by an increment of new needs. In attaining such an objective, the program must further face the vexing problems of manpower to furnish the service, more equitable distribution of that manpower, a service that falls within the means of greater numbers of people and, lastly, the overcoming of man's ignorance of the value of, or lack of enthusiasm for, dental health.

SERVICES TO BE RENDERED UNDER A NATIONAL DENTAL CARE PROGRAM*

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In discussing a national dental care program, it must be constantly borne in mind that we are speaking of a future, long-range program. The setting up and working out of such a program is dependent on, first, trained manpower and, second, money. Neither essential item is at present available in sufficient quantity. Therefore, anything that we say at this time concerning a national dental care program is based on the assumption and the hope that the men and the money will be available ultimately. Given enough men and enough money, what should such a program set out to accomplish?

Fundamentally, a national dental care program, like the national medical care program advocated by the Subcommittee on Medical Care of the American Public Health Association,[1] should make available to the entire population, regardless of the financial means of any group, all essential preventive, diagnostic and corrective dental services. The program should include education that will motivate all groups to take advantage of available facilities for dental care and to establish such facilities in areas where they do not exist. It should also make provision for continuous research into the causes, prevention and treatment of dental disease; for constant evaluation of the effectiveness of methods used in rendering the various services, and for maintaining standards satisfactory to the public and the dental profession.

Need for the Program

The suggestion that steps be taken now toward setting up and operating a national dental care program is justified by the present need of a large part of the

*Read before the Dental Health Section of the American Public Health Association, New York, N. Y., October 3, 1944.

†Director, Division of Dental Health, Minnesota Department of Health.

18. Klein, Henry, and Palmer, C. E.: Community Economic Status and Dental Problem of School Children. Pub. Health Rep., 55:187-203, February 2, 1940.

1. Am. J. Pub. Health, 34:984-988, September 1944.

population. It has been estimated that not more than 25 per cent of the American people now receive adequate dental care. Poverty and ignorance, or indifference, account for failure of a considerable number to receive adequate service, but, in many instances, the chief reason for dental neglect is the fact that professional dental care is not available. A member of a rural family, for instance, may need to travel so far to reach a dentist that nothing short of a violent or long-continued toothache will induce him to make the journey. In some sparsely settled states, even town dwellers are sometimes a hundred miles or more from the nearest dentist.

In a great many areas, there never have been enough dentists to take care of the entire population. Redistribution of dentists will help if it can be accomplished during the postwar era, but it will not provide enough trained men to take care of all those who need dental service. This manpower shortage is almost certainly the biggest problem facing the dental profession today, yet a fact frequently overlooked by many people who discuss dental needs. Such people see clearly only one side of the problem. They are well aware of the needs of the population and, with those needs in mind, they propose setting up numerous clinics to provide dental service. Their proposals often tend to ignore the serious lack of trained personnel to administer and operate the clinic. Even if funds became available tomorrow for their training in considerable number, it would be several years before the dentists would be ready to render service.

Nor is the dental manpower shortage limited to practitioners: there is also a lack of persons qualified to administer dental health educational programs through state health departments, and present training programs are utterly inadequate to fill these needs. Moreover, little training in public health dentistry is available to medical, nursing and dental students; and, in many states, there is almost no health education available for teachers, physical education directors and educational administrators, on whom depends, in large measure, the dental health education of children.

Training of people to promote dental health can be accomplished in a much shorter time than training of dental practitioners. We may be asked whether we are justified in promoting dental health education when the primary purpose of such education is to teach the benefits of dental care. Should we continue to urge millions of people to seek early and frequent dental care when the facilities for providing dental services are sufficient only for thousands?

I think we can say yes to both questions because, by dental health education, we can in time actually reduce the need for dental reparative service. We do not stop teaching fire prevention and control in seasons and in areas in which water is scarce. At such times and places, we increase rather than diminish instruction to the public as to how to use available control measures most economically and effectively. Such, it seems to me, should be our policy in regard to dental health. If education can induce more people to obtain timely dental care, the need for an extensive reparative program will be greatly reduced. The immediate problem, then, is how can we most effectively and economically reduce the need for universal dental service since the provision of such service, for a long time to come, will be impossible?

Reducing the Need for Dental Services

A national dental care program should, of course, aim to provide adequate dental service for all the people in all areas of the country. Such service should commence as soon as all the deciduous teeth are erupted and should continue throughout life at intervals frequent enough to prevent all unnecessary loss of teeth and to maintain optimum health of their

supporting structures. Because neither manpower nor money is available for such complete service, it cannot possibly be made available to all people in all areas of the country in the near future. The men and the money will not be forthcoming until public and professional interest in universal dental health have developed far beyond their present status. Meanwhile, we must do what we can.

All responsible groups and individuals who have made or are now making suggestions for postwar dental health programs base their recommendations on the principle that, while immediate needs should be met as completely as possible, the need for future service should at the same time be reduced. In 1940, Thomas Parran summed up the situation in these words:

> Assuming that we cannot multiply by several times the number of dentists overnight, nor can we secure overnight tremendously increased expenditures on the part of the general population for dental care . . . we can do the best job under present knowledge of preventive dentistry by taking care of the annual crop of new dental defects which appear in grade school children. In a relatively few years, even if only that were done, some of the old folks would have died off; and we would have raised a generation in this country of children later to become young adults and adults whose dental needs were met from the beginning at a total expenditure of the dentist's time and of the patient's money vastly less than that which now is being spent in trying to patch up the results of ten, twenty or forty years of neglect.[2]

Minimum Essential Services

A practical dental service program that would put Dr. Parran's suggestion into effect has been proposed by the Low Income Group Committee of the A.D.A. Council on Dental Health, of which Frank C. Cady is chairman. The report is too long to quote in detail, but recommendations of the committee may be summed up in their statement that "complete treatment should be provided for preschool children and for school children in the lower grades with limited treatment given older children until a complete treatment plan for the younger age group has been put into effect."

Using a list of minimum essential services provided by the American Society of Dentistry for Children, the A.D.A. committee recommends examination and prophylaxis, restoration of carious teeth, pulp treatment, treatment of mouth infection, and necessary extractions and surgical care for all age groups; also the use of space maintainers when necessary for younger children, and prosthetic restorations to replace missing teeth for those of teen age.

There will be little disagreement with the committee's recommendations that bitewing roentgenograms be taken at least once a year, that all pit and fissure cavities be filled, that local anesthesia be provided for operations liable to cause pain and that infected teeth not amenable to successful treatment be extracted.

Both the A.D.A. committee and the Institute on Dental Health Economics held at Ann Arbor last June made recommendations concerning minimum dental treatment for adults unable to pay for their own dental care. The two groups agree that relief of pain and elimination of infection should constitute the minimum amount of dental treatment provided for adults, the amount of restorative treatment to depend on available funds and facilities.

An ideal national dental care program should, of course, provide for all necessary dental service for adults, including periodontia, oral surgery and prosthetics; but it is impractical to visualize such a program as taking form within the near future. As Dr. Parran has pointed out, the dental reparative problems of adults are probably beyond solution in our lifetime. Consequently, it is wiser to concentrate proposals or suggestions on what

2. Proc. D. Centenary Celebration, March 1940, pp. 59-61.

we can reasonably hope to do, always keeping in mind the fact that we are not meeting the requirements of a complete or ideal service program.

In addition to service rendered in the dental chair, a national dental care program should include education. Such education should be designed to help the public make the most effective use of available dental care facilities, also of whatever preventive measures are established by dental research studies. Only those preventive measures that prove both reliable and practical should be advocated. Dietary reform and mouth cleanliness are not very likely to offer much in the way of control of caries, chiefly because these measures demand of the individual more than he is willing to contribute to his own well-being. Effective preventive measures may well be available in the near future, but the widespread recommendation of such measures should await the findings of the research men.

Responsibility for Dental Service

Until a national dental care program covering the entire population becomes feasible, various state and local programs will continue to provide a partial solution for the problem. It is well for us to remember, in this connection, that responsibility for public dental health rests, in varying degrees, upon all health and educational agencies. As most of us are aware, the greatest amount of financial aid for dental health programs at present has a federal source. States and local communities have made contributions that will need to be continued and increased. It is especially desirable that state legislators be brought to a realization of the needs and benefits of dental health programs.

As local and state dental health programs increase their scope and as nationwide coverage is approached, the aid that has been given by both official and nonofficial agencies will need to be maintained and expanded. Schools will, no doubt, continue to make a valuable contribution by motivating children to obtain needed dental care. Welfare agencies will supply essential aid by providing trained personnel to select persons eligible to receive free or low-cost reparative services. The American Dental Association will render especially valuable help by making available the knowledge and experience of the organized dental profession. Practicing dentists in public health work and in private offices will continue to be the key men in the whole program. Its success depends on their skill and knowledge, and they are, therefore, entitled to a large share in formulating the blueprints for any national dental care program.

Parents, teachers, youth counselors, nutritionists, nurses, physicians—all who claim any interest in any phase of health or education—are concerned in the promotion of dental health, whether or not they realize the fact. Finally, we come to the individuals directly concerned—the men, women, and children who are the recipients and also (as taxpayers) the ultimate providers of public dental health service. Sometimes, it is advisable to emphasize the responsibility of a certain group because of the special contribution that it can or should make to the total sum of dental health service; but we shall achieve the greatest success if we recognize "service to be rendered" not as something to be handed down from a superior group to an inferior or less fortunate one, but rather as something that should be established, organized and conducted by all of us for the benefit of all of us.

Only by so doing can we maintain and promote a national dental health program that will be a true expression of democracy in action.

ADMINISTRATION OF A NATIONAL DENTAL CARE PROGRAM*

Richard C. Leonard, D.D.S., M.S.P.H., Baltimore, Md.

Administration means "management" and implies the existence of the thing to be managed. A national dental care program does not actually exist. Many proposals have been made regarding such a program. Of these, none, probably, so concisely and so unanimously expresses the ideas of leaders in the dental profession and in the field of public dental health as do the deliberations of representatives of both those groups at the Institute on Dental Health Economics held in Ann Arbor, Mich., last June. Accordingly, this discussion will, in large part, follow the expressions of opinion of that meeting, any additions, clearly defined as such, being personal ideas as to how certain related factors in promoting public dental health may be integrated with those enunciated at the institute. To facilitate consideration of this presentation, the accompanying chart depicts the "flow" of an organization to provide dental health service. The "solid line" blocks of the chart are those agreed to by the registrants at the institute. The "broken line" blocks are my additions. The only other change is in the title of the chart, the one given being considered as better fitting the assigned title of the paper.

First thought may consider it paradoxical to place the community at the top of a chart depicting a national program. But the propriety of this arrangement becomes clear when one analyzes the problem of dental ill-health and weighs the importance of the various levels at which attack on that problem may be made. If, as the chart indicates, the problem of dental ill-health is resolved into three phases, correctional, educational and research, it is apparent that the real application of the first two of these will be at the local or community level. At this local level will be found all of the complications and intricacies that will affect both the administration and the end-result of the program. Any dental health program is basically directed toward the individual. The community affords the nearest contact with the individual.

Starting, then, with the community, let us first consider the local factors in any dental health program. Because of their essentiality to the dental health of the community, and constituting as they do the existing facility for dental care, the local dentists merit initial discussion. Their part in a dental health program may be stated as follows: as (a) purveyors of dental service to the public, within the limits of their time capacity to render that service; (b) consultants in matters related to plans for expanding the amount of dental service available within their community, and (c) advisors on the administration of such plans when once inaugurated. The importance of the utilization of local dentists in these capacities cannot be overemphasized. Without such service on their part, the program at the local level faces a warranted failure in whole or in part.

Cooperation of a dental organization in which local dentists are joined should be sought in the foregoing roles of the

*Read before the Section on Dental Health, Seventy-Third Annual Meeting of the American Public Health Association, New York, N. Y., October 3, 1944.

local practitioner. Organized dentistry constitutes a large part of the existing agency for preventive and correctional dental care. Not to enlist the cooperation of such groups, not to utilize the service that their individual members are alone able to provide, would be the utmost folly; but private practice by the present number of dentists and with their present distribution cannot, in all cases, bear the burden of providing dental care to all or to a large portion of the public should an emphasized national dental health program suddenly enlarge the demand for such care. There are not enough dentists and the tendency of the profession to center practice in the larger urban areas leaves areas wherein dental service is either completely lacking or relatively inadequate. The provision of dental service in these areas will require the augmenting of existing facilities by clinical service sponsored by governmental agencies. In the establishment of clinics, two factors in the participation of local dentists should be borne in mind: The clinic service should cover only that portion of local dental care that local dentists cannot themselves provide, and local dentists should have a voice in the direction of the local clinical and dental health educational program. Where dental societies exist, these ends may possibly be best attained by committees of the society. Local committees, as indicated on the chart, should utilize the consultive advice of similar committees of the state or national level.

When private practice alone cannot care for local dental health needs, we may assume that, under a national dental health program, a clinic service will be established. Because it is a public health activity, such a service should be placed within the local official health agency; but because of the distinctive problem involved in the administration of a remedial dental health service, it should not be left to the direction of the head of the local health agency. Physicians are usually found in such positions, and while it may be within their province to head, nominally, all public health activities, actual control of dental service should be vested in a dentist as director, he having the consultive advice of his professional confrères in local dental practice. These arrangements need not, as some may feel, either nullify the authority of a medical health officer or subordinate dentistry to medicine. It is, rather, a matter of sensible cooperation, of recognition of the facts that dentistry is a health service and that it is constituted of factors on which only trained dentists are authorities. With this attitude, the direction of a local dental health program may be left to a "dental health officer."

The activity of the dental health officer depends on the size and scope of the local dental health problem. In one situation, he may with justification be the entire local official dental health personnel. In others, his task may be largely an administrative one, the actual remedial work in the clinics being carried on by full-time or part-time dentists serving as clinicians. In any situation, it is essential that a dental health officer have the background of training and experience that will fit him for the dual role of dentist and administrator.

As to the actual program to be administered at the local level, little can be offered in a discussion of this sort. Too many facts—the dentist-population ratio, the economic status of the population, the character of the community (e.g., whether it is urban or rural, largely industrial or industrialized but little), the nature of the agencies established in the interest of public health, the extent of local financing of public health projects —all these and others will influence the type and scope of the local dental health program; but, with thorough consideration of the same facts as a basis for the initial steps in clinic inauguration and the provision of dental direction, dental

society cooperation and adequate financing, any community may anticipate a successful dental health clinical program.

The success or failure of the local clinical program, and indeed the entire dental health program, may be marked by the amount of local activity in the field of dental health education. Only by an educationally inspired desire for dental health will there be developed that positive action on the part of the public resulting in those practices known to promote mouth health. In largest part, only to lack of knowledge as to the importance of dental health may be ascribed the deplorable dental conditions now known to exist. Lack of knowledge is to be altered only by education. Hence, at every level of a dental health program, it is incumbent that there be available in, or as an adjunct to, the program trained educationists and authentic dental health material. That, at the local level, such personnel and materials are not always possible is obvious. Here, then, is where the state and federal agencies may directly aid in the local effort. Indeed, in most instances, the utilization of educationist personnel and materials carefully selected by state or federal dental health workers, or both, seems preferable to the practice of allowing each community to select its own.

The program at the community level has been dealt with in considerable detail because, as stated, it is here that the applicability of any program proposed by a state or by the federal government will be proved. Less need be said about the program at the other levels. Indeed, with but slightly more than brief reference to the chart, we may quickly summarize the parts to be played by state and federal dental health agencies.

To insure unanimity of purpose in the various local programs, it is essential that a statewide program be an integrated part of the state's public health department. This dental health agency should be headed by a dentist especially trained and, as far as possible, experienced in public health administration. To him falls the task of integrating local programs in a statewide project, comprehending those variations of the local levels that require on his part a flexibility in administration that will result in the greatest amount of dental health for the state population.

All the autonomy possible under a medically directed program, as a state health department agency, should be accorded the dental health "division" or "bureau." To facilitate divisional activity, the policy-making body of the department (i.e., the state board of health) should have as a member a representative of the dental profession.

The state dental director's duties will, of course, vary in administrative extent according to the personnel of which the dental division is comprised. Ideally, the director should have subordinate personnel consisting of (1) a divisional representative from the state department to local programs, (2) a dental health educationist and (3) a supervisor of industrial dental health activity. If such a personnel is impossible, the director must assume these activities in addition to his more purely administrative duties. Among the latter, none is more important than the management of the funds, federal, state and, in some cases, local, by which the program is financed. This paper is no place for argument about the amount of money that should be allocated to the dental program; but a plea can and should be made for the earmarking of funds for specific use in the dental program. This constitutes an administrative problem for dental directors of all levels, but its accomplishment affords relief from the greater administrative problem of attempting to maintain a program with an uncertain, varying budget.

Since a lack of trained personnel constitutes a tremendous obstacle to a successful application of a dental health

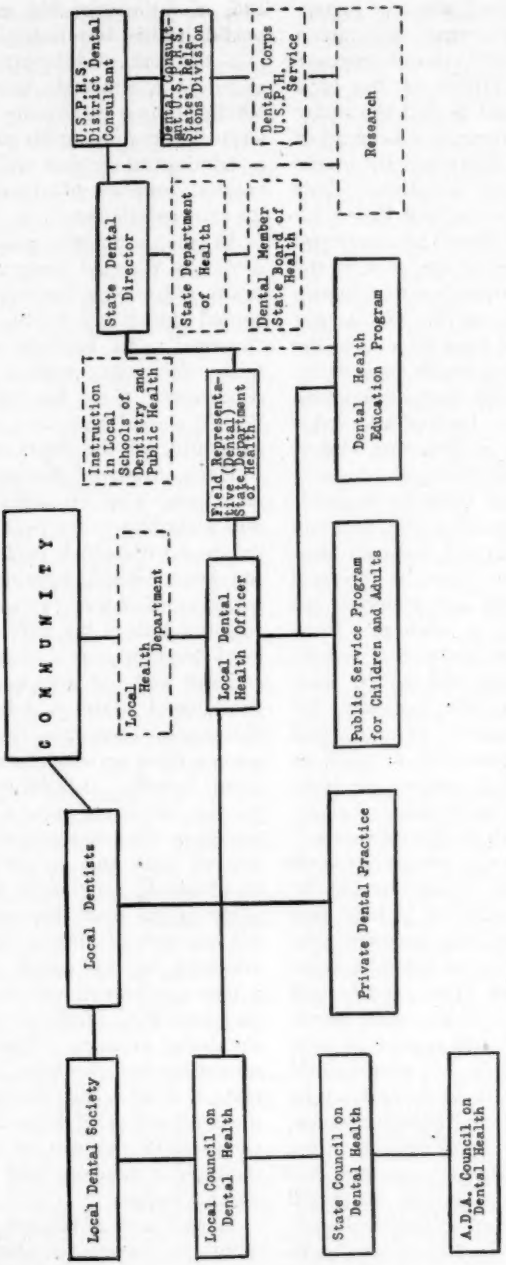
COMMUNITY
Local Dentists
Local Dental Society
Local Council on Dental Health
State Council on Dental Health
A.D.A. Council on Dental Health
Private Dental Practice
Local Health Department
Local Dental Health Officer
Public Service Program for Children and Adults
Instruction in Local Schools of Dentistry and Public Health
Field Representative (Dental) State Department of Health
Dental Health Education Program
State Dental Director
State Department of Health
Dental Member State Board of Health
U.S.P.H.S. District Dental Consultant
Dental Consultant-States Relations Division
Dental Corps U.S.P.H. Service
Research

Chart of Administrative Organization of a National Dental Care Program

program, steps to improve this situation become a related activity of the state or federal dental directors, or both. In schools of dentistry and of public health, courses in public dental health should, when possible, be established. When fitted for the role, the dental director should assume the task of developing and administering these courses. If he does, not only will there be available more personnel for the field of public dental health, but also the private dental practitioner of the future will have a clearer comprehension of the problem of public health and his relationship to it.

Specific recommendations relative to the dental program at the national level are not indicated in this presentation. The accompanying chart depicts two units of activity of the present Dental Corps, United States Public Health Service. Although existent, these units would, under the pressure of a nation-wide dental health program, need expansion in scope and in administrative authority. To them, states should be able to turn for aid in local applications of the program, for consultation on the myriads of problems bound to arise and for the specific allocation of funds to dental health projects in accordance with whatever provisions are made for the joint assumption of program financing by federal, state and local agencies.

Somewhat apart from and yet certainly related to the administrative functions of a dental health program is the matter of research. That from the laboratories there will come new, improved methods of maintaining dental health is more than a mere hope; and, when new discoveries are made, their applicability may be determined through their utilization by the dental health agencies that, at various levels, administer the dental health program. Particularly, at state and federal levels, it seems advisable that there be maintained a close relationship between the research workers and the program administrator.

This relationship may be said to have two bonds; namely, the use already referred to, by the administrators of the product of the research workers' effort and, equally important, the provision, through the administrator, of funds with which the research worker may finance his investigations. These bonds inextricably tie together the field of research and dental health administration.

In closing, permit me to refer, for a broader and clearer presentation of the suggestions made herein, to the recently or soon to be published proceedings of the Institute on Dental Health Economics previously referred to and, equally worth while, the various articles on the subject of a national dental health program published in THE JOURNAL. These will not merely reveal the problem; they will also attest the readiness of the dental profession to assume the administrative problems involved.

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THE EVOLUTION OF HEALTH SERVICE AUXILIARY GROUPS*

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For several years, there has been considerable speculation regarding the adequacy of dental personnel in the United States when appraised in terms of the growing problems involved in providing dental care. Interest in the question has been intensified by the requirements of the war, by the probable reduction in graduates during the next several years and by the advances in appreciation of dental health. At the same time, many and varied plans have been suggested for extending dental care. For the reason that these plans indicate a serious need for expansion of dental personnel, it is natural that there be some manifestation of interest in the possibilities which may lie in an increase in number, and greater use of auxiliary workers. Because of the current interest in the question, it appeared desirable to locate the forces that have brought auxiliary groups into existence in health service fields, and also to determine as far as possible the extent to which these and other forces may now or in the near future become operative in the field of dentistry.

Not many years ago, when the problems of dental and medical care were far less complex than they are at present, dentists and physicians bore nearly all of the responsibility involved in providing medical and dental care. Gradually, throughout the years, there has evolved a group of workers trained to carry on certain activities under the supervision of physicians and dentists. These include dental hygienists, nurses, medical technologists, physical therapy technicians and dental assistants. In number, these workers exceed the total number of physicians and dentists, but distribution is uneven, there being five or six trained auxiliary workers for each physician, and approximately two-thirds of such aid for each dentist.

What has brought about this increase in auxiliary workers? The answer to this question is to be found in a combination of factors, but more especially in (a) the expansion of worth while knowledge which, it is thought, should be utilized in health service fields; (b) increased recognition of public health need, and of the social and economic consequences of ill health, and (c) lengthening of the undergraduate period of training.

In regard to the first factor, it is quite evident that expansion of knowledge as to the cause, nature and treatment of disease broadens any field of health service, increasing the total units of service that it has to offer. With the advances in bacteriology came the broad problem of providing immunization service and other means of communicable disease control. Radiography and other diagnostic aids have disclosed more diseases and defects. Anesthesia has extended the field of surgery, and advances in chemotherapy have opened new avenues of treatment. In view of the great advances in the basic sciences and the art of medicine, it would be impossible to estimate the number of services per physician as compared with those of the nineteenth century. It is sufficient to say that the number is many times as great and the whole situation more complex than at any time in the history of medicine.

*Read before the Massachusetts Dental Hygienists' Association, April 29, 1945.

Recognition of public health need has increased steadily throughout the years. This is also true in regard to appreciation of the social and economic consequences of disease and of physical deficiencies. This recognition and appreciation are both reflected in many ways, but more especially in the many plans that have been advanced for the purpose of expanding medical care; in the increased expenditures for research, and the extent of the public health education movement. In general, the increased consciousness regarding health needs constitutes a compelling force for research and for utilization of its findings.

A natural consequence of an increased body of knowledge and growth of needed services in any field is extension of the period of training and a demand for higher qualifications for admission to the undergraduate course. It is, of course, also true that, while the period of training may be extended for other reasons, the only justification for extending it lies in the requirements imposed by increased complexity of intellectual content and the skill that is involved. In any event, and aside from the desirable outcome of a lengthened period of undergraduate education, three byproducts of considerable importance result from the change. They are: increase in the costs of the services offered in that field, and shortening of the practitioner's period of work expectancy and, in addition, pressure for the removal or exclusion from the curriculum of those items with which the practitioner will not have time to deal, or those in which he is not interested and is willing to delegate to others. It is a well-established fact that men or women who undergo long periods of intensive training in complex fields are not contented when they are required to engage in activities that can be carried on by persons trained over shorter periods.

The great scientific advances of the last half of the nineteenth century greatly expanded the field of medicine, increasing its responsibilities and eventually creating a need for increased nursing service. At first, there was much opposition to the formal training and the registration of nurses. Since the first registration of nurses in 1903, this group has grown steadily, and there were approximately 355,000 registered and student nurses according to the U. S. Census of April 1940. This is two nurses for each physician, as compared with one for each physician in 1920.

Another and similar example of the evolution of an auxiliary group is to be seen in the field of medical technology. In the early days, the physician made such simple tests as were known. With continued advances in science, the use of innumerable chemical, bacteriologic, histologic, serologic and other tests became routine in the diagnosis and treatment of disease. From this testing service, there has evolved, in an orderly way, the medical technologist or the clinical laboratory technician. In 1928, a registry of medical technologists was established for the purpose of organizing standards of training and registration. In the matter of training and registering medical technologists, there was little if any dissent among physicians. Evidently, in this case, the three forces—growth of knowledge, public need and length of medical training—operated at the same time and with the same force.

Without exception, every auxiliary group that carries on activities under the direction of the physician has evolved in the same way and for the same reasons. Occasionally, some have been slightly ahead of their time, while others have been behind the demand for their services. In recent years, evolution of newer groups has proceeded more rapidly than those of the earlier years, and delegation of less complex activities has become rather widespread in the field of medicine. It is very likely that, as the problems of medical care and medical education become more complex, and as

science continues to advance, additional auxiliary groups will come into existence as aids to the physician.

The situation with regard to the dental laboratory technician has been quite similar to that of technicians in the field of medicine. Most of these technicians are in commercial dental laboratories; nevertheless, they carry on activities delegated to them by the dentist. According to Morrey,[1] there were, in 1890, but two commercial dental laboratories, while in 1944 there were 2,800. Laboratory technicians had increased from a small number in 1890 to approximately 14,000 in 1941[2]; and this despite the view of many teachers and practitioners that the dentist should do all his laboratory work.

At this point, it is interesting to note that, from 1919 to 1920, the number of dental assistants increased by 105 per cent,[3] while the increase in dentists for the same period was 40 per cent. Again, from 1920 to 1930,[4] the increase in assistants was 100 per cent, against a 26 per cent increase in dental practitioners. Yet even today approximately 50 per cent of the active dentists in the United States do not have office assistants. It is important to keep this in mind when one considers questions regarding the delegation to others of routine or less complex activities in the field of dentistry.

It is now thirty-two years since training in dental hygiene began at Bridgeport, Conn. Eighteen years later, there were but 323[5] students enrolled in dental hygiene courses. In fact, during the last fifteen years, the largest annual enrolment has been 377; the lowest 240, and the average 304. Although it is estimated that there are 7,000[2] dental hygienists in the United States, the number of active hygienists must be considerably below this point. It is quite clear that growth in the number of hygienists has been slow, in fact considerably slower than the number of members of many auxiliary groups in the field of medicine or dentistry.

War, and especially the first world war, has initiated an increase in auxiliary workers in the field of medicine. The reason for this is to be seen in the fact that war increases the content of medical practice. Because dental hygiene as a field of service was but 5 years old at the close of the first world war, there was no significant expansion of that field. Even in the prosperous period after the first world war, and in the period of depression that followed, the number of graduates in dental hygiene increased but slightly. The first factor in this slow growth has been the willingness of many dentists to delegate prophylactic service to the hygienist, while the second is the comparatively low value placed upon this service. These two factors have in turn influenced the speed with which the various states have enacted laws permitting practice by dental hygienists.

As far as can be determined, there has been no significant correlation of growth of the body of knowledge in dentistry, lengthening of the period of training and expansion of auxiliary workers, except perhaps in the field of laboratory prosthesis. This may in general be due to the possibility that, up to the present time, new developments have not made sufficient impact on the existing number of dentists or on the position of dentistry as a health service. Up to 1941, dental personnel has always been considered adequate; and the health implications of oral diseases have received significant recognition only in the last thirty years. Yet the period of training has been extended from three years based on graduation from high school to four years with a two year college admission requirement, a total increase of three years. Thus, one of the three primary forces which give rise to expansion of auxiliary groups clearly exists. It may be worth

1. Morrey, L. W.: Dental Personnel. J.A.D.A., 32:137, February 1, 1945.
2. Reference 1, p. 143.
3. Federal Census 1910-1920.
4. Federal Census 1920-1930.
5. Dental Students Register.

while to consider the possibility that the other forces may create pressure in the near future.

In regard to the growth of knowledge in dentistry, it can be said that important advances have been made in surgery, orthodontics, restorative dentistry and the control and treatment of diseases of the supporting tissues. Substantial control of dental caries is now possible through early treatment, and an excellent beginning has been made in testing methods of control through chemotherapy or diet. It is now well established that more significant control and treatment can be accomplished on the basis of broad diagnosis, and this is more and more requiring that the dentist consider the whole patient. More is known regarding problems of growth and development, of nutritional relationships, of the oral manifestations of systemic disease and of systemic manifestations of oral diseases and deficiencies. While it is still true that dental service is predominantly operative and prosthetic, there is much new knowledge pressing for utilization in dental practice. This is not a criticism; it is simply to say that good dentists have been required to spend most of their time meeting the demand for fillings and prosthetic appliances. Some items largely surgical or orthodontic have been delegated to specialists, but, as compared with solution of the whole problem, this delegation has not been significant.

As concerns recognition of public dental needs, it is evident that this was increasing before the war, being based on the widespread prevalence of oral disease, and a growing appreciation of its implications. Evidence to this effect is abundant, representing the accumulation of a considerable number of years. It has been fostered by the widespread prevalence of oral disease, by programs of health education and by the startling disclosures of selective service examinations. At least, one may suggest that recognition has reached a point where it has brought the problem of dental care into the various plans for expanding health service in the United States.

It is evident that the three primary factors in the evolution of auxiliary services are now creating increased pressure in the field of dentistry. There are, in addition, two unusual forces, both of which deserve serious consideration. The first has to do with the expected or current shortage of active dentists. It is not possible to estimate the adequacy of the dentist population ratio of 1940, which was one dentist to 1,870 persons of all ages. Yet if this ratio is taken as a basis for evaluating the situation in the future, it is clear that, by 1950, there will be a shortage of at least 5,000 active dentists. There appears to be no way of avoiding this deficiency. The actual deficit measured in terms of expected increased need and demand will, of course, be much greater. A large unsatisfied demand for dental service has existed for several years, and to it every dental health education program makes some contribution. As a probable factor in increasing the demand for dental care, one need point only to the prevalence of dental disease and deficiency in the United States, and the probability that interest in physical fitness growing out of the war, imposed on previously existing trends toward increasing the availability of dental care will cause the demand for dental service to reach a much higher point.

The trend toward further delegation of activities to auxiliary groups may be influenced by changes in the age composition of dentists. In 1920, only 28.7 per cent of dentists were over 45 years of age.[6] In 1930, this had risen to 36.5[7] and in 1940 to 45.8 per cent.[8] For many years, the median age of physicians has been considerably greater than that of dentists, owing to the fact that the physician's period of training has been longer

6. Federal Census 1920.
7. Federal Census 1930.
8. Federal Census 1940.

and that extension of this period began at an earlier date. In 1920, there were 21 per cent more physicians than dentists above 45 years of age. In 1930, there were 19 per cent more; while, in 1940, the difference had decreased to 2 per cent. In 1940, the median age of physicians was 44.1 and that of dentists 43.6, a difference of one-half year. This increase in the median age of dentists will continue for several years and will rise sharply because of the decrease in number of graduates in 1948-1949 and perhaps in 1950. It is probable that the median age of dentists will soon exceed that of physicians. This is bound to have an important bearing on the total number of years a dentist may expect to practice, but more especially on his effectiveness when he enters the period of declining activity, which in general begins between 55 and 60 years. Here it is evident that the greater use of auxiliary service may be related to delaying the period of declining activity and aiding in maintaining effectiveness after this period has been reached.

The second additional force is seen in the fact that both dental and medical needs have been strongly influenced by changes in the age composition of the population, and this is a fact that rarely receives consideration in dentistry. Because of a decline in the birth rate, on the one hand, and the mortality rate on the other, the proportion of older people in our population has been gradually increasing. When dentistry became an organized profession in 1840, the median age of the population was 17.8 years and life expectancy about 41 years. The proportion of persons over 65 years was, of course, small. The median age of our population increased to 29.0 years in 1940, or a total increase of 11.2 years in the last century. While the population increased by 7.2 per cent from 1930 to 1940, the number of persons 65 years and over increased by 35 per cent, or five times that of the increase in the general population. It is evident that this trend will continue for years to come.

The needs of the population in the way of dental and medical service have also increased. There is more degenerative disease, more heart disease, cancer and diabetes and other conditions. More people are also attaining the ages when the accumulated effects of dental caries, malnutrition and ill health are reflected in the loss of teeth and in periodontal disease. What is forgotten is that the population now under consideration is quite different from that of fifty or seventy-five years ago. The advance in life expectancy to approximately 63 years has created greater dental need per unit of population, and imposed an obligation on the dental profession to maintain dental health approximately twenty-two years longer than was the case in 1840.

Apparently, then, pressure from several sources on dentistry may, in the postwar period, operate to increase the delegation of certain activities to dental hygienists and dental technicians. Just what relief from pressure can be accomplished by increasing the number of hygienists and by making greater use of laboratory technicians it is of course impossible to predict. Nevertheless, the total time conserved would doubtless be, in service hours, equal to that expended by a considerable number of active dentists. For that reason, if for no other, it is probable that there will need be increased delegation of activities to existing auxiliary services in the postwar period. Under all the circumstances involved, this is almost bound to occur.

It is a reasonably safe assumption that with the great scientific advance associated with the present war, outstanding basic contributions will be made to dental knowledge. It is of course impossible to predict the nature of these contributions or the time at which they will exert pressure on dentistry. If, as some one has suggested, our frontiers in science will have been advanced by twenty years, it

would indeed be unwise to assume that somehow the field of dentistry can escape the forces that will be released in the postwar period. It is also unwise to assume that new knowledge will decrease rather than increase the total number of dental services available. Even if a means of preventing dental caries were discovered, its administration to a larger dental population would require considerable personnel for many years. Furthermore, there would remain the treatment of supporting tissue diseases, orthodontics and other services that are not at present receiving the attention which they warrant.

Whether new auxiliary groups eventually will be established or the duties of the dental hygienist extended to other intra-oral activities will depend on several conditions. Evolution in this direction might result from outstanding demands for the expansion of dental care, especially if dental personnel is at the same time inadequate. It would, of course, be futile to create a new group or expand the duties of the dental hygienist until this concept of broadened delegation is generally accepted by dentists, and this will not be the case until the attitude of dentists is molded by the various pressures associated with the problem. The principle involved in this expansion of auxiliary services is sound, and while the movement for action on this principle may be ahead of its time, its value and effects need to be weighed against other plans for extending dental care. It also should be weighed against the fact that persons who have been trained over a period of six or seven years are not going to be willing to accept low salaried positions in public and private clinics. This might be true if there were dental personnel in excess, and it in fact may occur in certain metropolitan centers where there is a high concentration of dentists. In general, it can be shown that the best source of dental care is the office of the private practitioner. To keep this source the predominantly effective one may, in the future, require greater delegation of services than is now visualized by dentists.

Associated directly with this whole problem are dental hygienists. There is no doubt that the number of hygienists would have greatly increased since 1941 had adequate student material been available. There are good reasons for the belief that the number will expand considerably after the end of the war. It is probable that more women will seek training in some field and will be available to meet a greater demand for dental hygienists.

Finally, it is well to keep in mind that the auxiliary groups in medicine and dentistry have, as has been suggested, evolved in an orderly way. While this evolution has sometimes proceeded rapidly, at no time have these groups resulted from revolutionary processes. Perhaps the social revolution which we call war, and the revolution in science which it has brought into existence, may have greater effects on medicine and dental practice than are now expected. Not knowing what all of these effects may be, we cannot fully prepare to meet them. The least we can do is to recognize the action of certain forces for change that have been operative in the past, and those that now exist. From this recognition should come an alertness and a forward-looking point of view, both of which are essential in this period of rapid change.

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A DENTAL HEALTH INDEX*

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There is presented herein a brief description of the dental indices that have been published to date, and a method for determining the dental health capacity and DMF index of the first permanent molars. The dental indices are not arranged in the order of their importance, but according to their press appearance.

I. "A Quantitative Caries-Index for the Teeth." (Morelli.[1]) Morelli uses carious and filled teeth in his index to express:

1. The number of existing teeth.
2. The number of carious teeth.
3. The number of missing teeth.

He uses the quantitative measure (J) that is composed of a basic number (A) and a coefficient (n); thus, $J = An$. He arrives at the basic number (A) by dividing the number of existing teeth by the number of carious teeth or coefficient (n). Example:

$$\frac{\text{Existing teeth } 24}{\text{Carious teeth } 6} = 4 \text{ basic number}$$

Thus, the quantitative carious measure is expressed as 4_6. The two multiplied together equal 24, or number of existing teeth. This subtracted from the total complement of teeth (32) equals the number of missing teeth. Example: $32 - 24 = 8$.

This index does not take into consideration the development of new caries on different surfaces of the same tooth or the extension of the present cavity. Therefore, on repeated examination or application of this index to the same patient, no visible change will be apparent, until another tooth is lost.

II. "Public Health Aspects of Dental Decay in Children." (American Child Health Association.[2])

This is the original index of the American Child Health Association and the following items are scored:

1. Caries corrected and uncorrected in the first permanent molars and the second bicuspids. When the latter is unerupted, the deciduous second molar is scored.

2. The amount of stain and calculus and the evidence and degree of gingival inflammation, on the central and lateral incisors and on the first molars and second bicuspids or deciduous second molars.

A. Measurement of caries and fillings.
   (a) Amount of caries. Each cavity is classified according to the size of the area of the enamel that is carious.
   (b) Filling (correction). Cavities in which fillings have been placed are recorded as caries according to the area of the enamel destroyed.

B. Measurement of stain, calculus and gingivitis.
   (a) Stain, measured by a rating scale according to the size of the tooth surface covered by stain.
   (b) Calculus, measured by a

*Part of thesis submitted in partial fulfillment of the requirements for the degree of master of public health from the Massachusetts Institute of Technology.

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1. Morelli, G.: D. Cosmos, 66:1068-1075, October 1924.

2. American Child Health Association, School Health Research Monograph No. III, 1930, pp. 71-79.

rating scale according to the size of the area of the tooth surface covered by calculus.

(c) Gingivitis, the degree of inflammation of the gingival area adjacent to a tooth being recorded.

C. Measurement of enamel defects. Eight classifications of enamel defects including hypoplasia were obtained through careful and accurate examination and the surfaces of the teeth on which the defect appeared were recorded.

D. Scoring.

The scores for each symbol indicating the extent of tooth destruction findings were weighted inversely as to the variability of their occurrence. Caries (uncorrected) was scored separately from fillings (caries corrected), but the corresponding symbols were given the same weights. Abscesses or fistulae were included in the caries scores, although the observer could not be certain in all cases that such conditions were the result of caries.

III. "Measure of the Care and Preservation of the Teeth." (American Child Health Association.[3])

This is a revised index of the original American Child Health Index and was the result of the application of the original in an experimental survey and from that it was concluded that the best measure of past liability to caries was the the first molars.

It lists the following items and score:

(a) Amount of uncorrected caries in the first permanent molars 3
(b) Amount of corrected caries in the first permanent molars 3
(c) Proportion of caries corrected 6
(d) Proportion of missing first molars (girls) 1
(e) Proportion of missing first molars (boys) 1
(f) Proportion of noncarious first molars 1

The new index seems superior to and more easily applied than the original, since such items as tartar, stain and gingivitis were found on analysis to be unsuitable for inclusion and so have been eliminated, for the following reasons:

(a) Stain is unrelated to tartar, gingivitis or uncorrected caries.
(b) Tartar is related to gingivitis, but not to caries.
(c) Gingivitis has a slight tendency to increase in cases of uncorrected caries.

The scoring is less complicated than the original, but requires considerable time, since the values are added and the final score is correlated with mathematical tables.

III(*a*). "Criteria for Selection of Cases with Serious Dental Defects."[3]

This index is intended for use by lay persons, particularly teachers. Two criteria of selection were used and cases complying with either criterion were chosen, as follows:

1. Cases having two or more first molars with one-third or more of the occlusal surface carious.

2. Cases having one first molar with one-third or more of the occlusal surface carious and one or more first molars extracted. It was assumed that the extraction of the missing molars was the termination of a bad carious condition in that tooth.

This is not a practical index, since children with one missing or carious first molar would be given a perfect score. It considers only the most serious dental conditions; that is, extensive decay or absence of two or more molars.

IV. "Caries Index." (Mellanby.[4])

3. American Child Health Association, School Health Research Monograph No. V, 1933, pp. 23-32, 92.

4. Mellanby, May: Medical Research Council, Part III. Special Report Series No. 191, London, 1934, pp. 68-80.

In this study, the author used carious and filled teeth for her basis of investigation, and for the purpose of tabulating the degree or extent of caries. Symbols were used and the teeth were finally classified under the following four headings.

No caries—No C = degree 0.

Slight caries—C− = degree 1. Changes in the enamel such as dull, chalky patches, early fissure caries and pinpoint caries.

Moderate caries—C = degree 2. Cavities involving destruction up to about one-third of the crown.

Advanced caries—C+ = degree 3. Destruction of roughly one-third or more of the crown.

The disadvantages of this method of classifying the different cavities are as follows:

1. It gives uncertain results in the hands of different examiners because it is impossible for all dentists to classify all cavities uniformly.

2. There is a degree of uncertainty in judging the depth of the cavity in teeth that contain fillings, unless x-rays are used.

3. If the x-rays are employed, there will be a variance in the interpretation by different dentists.

V. "Studies on the Incidence of Dental Caries." (Day and Sedgwick.[5])

These authors used carious teeth and filled teeth in their investigation. Extracted teeth were considered as carious unless lost through trauma or extracted for esthetic reasons or orthodontic purposes. The caries index is obtained by dividing the number of teeth showing cavities by the number of teeth present in the mouth:

Group: $\frac{\text{Number of Cavities 1869}}{\text{Number of teeth present 2626}}$ = Caries index 0.71

104 children:

5. Day, C. D. M., and Sedgwick, H. J.: D. Cosmos, 77:442-452, May 1935.

These authors advocate the use of the x-rays for the complete examination and, by their use, the total number of cavities revealed was increased by 5 per cent. For the caries index, the use of x-rays, in addition to mirror and explorer, makes the examination costly and time-consuming and would rarely be available for every class room or school examination.

VI. "Susceptibility Caries Index." (McBeath and Zucker.[6])

This index shows the number of tooth surfaces attacked by caries during the specified time. In order to compare the rapidity with which caries is increasing in two individuals, it is necessary to reduce all indices to a common denominator. The authors make their calculations on the basis of 100 days. Example:

3 new caries areas for 365 days.

$3 \div 365 = 0.0082$ areas, increase for one day.

$0.0082 \times 100 = 0.82$ areas, increase for 100 days.

This is essentially the same as the "modified caries index," except that 100 days is the basis of calculation. The objections to it are the same as to a modified caries index and, with the added calculation, it would be less acceptable for school use.

VII. "Tooth Mortality Rate." (Knutson and Klein, in Child Hygiene Investigations, U. S. Public Health Service.[7])

The tooth mortality rate is determined by counting missing (extracted) permanent teeth and permanent teeth showing only remaining roots (badly decayed). The sum divided by the number of children and multiplied by 100 gives a tooth mortality rate of the number of lost teeth per hundred children.

I willingly admit that this is an excellent index in the hands of dentists, but the time consumed in an examination

6. McBeath, E. C., and Zucker, T. F.: J. Nutrition, 15:547-564, June 1938.

7. Knutson, J. W., and Klein, Henry: Pub. Health Rep., 53:1021-1032, June 24, 1938.

of the whole mouth seems to be wasted in view of the reported findings in previous studies (Hagerstown report), in which the authors suggested that a tooth mortality rate might be based on the findings regarding the first permanent molars solely, or even the lower right first molars.

VIII. "Lost Permanent Tooth Index." (Wisan.[8])

In this index, the lost permanent teeth requiring extraction and those previously extracted are observed and tabulated.

This index is figured on the basis of two separate rates.

1. The number of lost permanent teeth per hundred children. "Lost permanent teeth" means the total of both permanent teeth requiring extraction and those permanent teeth previously extracted.
2. The percentage of children with lost permanent teeth; that is, the percentage of children having permanent teeth requiring extraction or previously extracted permanent teeth.

Objections to this index are:

1. It is computed for children between the ages of 12 and 14 and consequently is not adaptable to an entire school program at different age and grade levels.
2. The index will only substantiate a fact already known, that 80-100 per cent of all permanent teeth lost at those ages are first molars.
3. In view of the fact already established in objection 2, the examination of the entire permanent dentition becomes an actual waste of time.

IX. "Modified Dental Caries Index." (Bodecker.[9])

Bodecker uses the number of carious or filled surfaces and areas of teeth as units of calculation.

The index is computed by counting the number of surfaces of each tooth that is affected by caries, each surface counting one unit except as follows:

a. Maxillary teeth.
   1. Each carious or filled occlusal pit on maxillary molars counts one unit (entire occlusal surface two units).
   2. Each carious or filled pit on the lingual surface of maxillary first and second molars counts one unit (entire lingual surface two units).
b. Mandibular teeth.
   1. Each carious or filled pit on the occlusal surface of mandibular bicuspids counts one unit (entire occlusal surface two units).

The counting of two units rather than one is explained by reason of the fact that these are exceptional surfaces, separated by a strong enamel ridge, and often one pit will become involved and not the other. Thus, there are two caries-susceptible areas.

c. Proximal surfaces of molars and bicuspids are occasionally assigned a two-unit count in those cases where the insertion of a filling would involve the occlusal surface of the tooth.
d. A full-crown tooth is assigned three units unless it serves as a bridge abutment and the corresponding tooth on the opposite side of the same jaw is noncarious, or if caries is not particularly active, in which case a lower unit is assigned.
e. Missing extracted teeth are assigned three units.

The caries index is the sum of the units obtained, which represents the number of tooth surfaces or susceptible areas destroyed by caries.

There are 180 tooth surfaces or caries-susceptible areas on thirty-two perma-

8. Wisan, J. M.: Am. J. Pub. Health, 28: 859-862, July 1938.

9. Bodecker, C. F.: J.A.D.A., 26:1453-1460, September 1939.

nent teeth. The index is expressed as a ratio of the sum of the units to the total number of surfaces or areas; e. g., 30:180.

X. "Dental Health Capacity." (Jensen.[10])

"Dental health capacity" means the capacity of the dental mechanism to function through life. The means of measuring this capacity is essentially a demerit system, which uses six classes to express the range of well-being from the best to the worst.

Class 0 represents no loss; Class 5 represents complete loss, and Classes 1, 2, 3 and 4 represent symmetrical divisions of the intervening degree between these two extremes.

TABLE 1.—DENTAL HEALTH CAPACITY

Tooth Structure Losses	Soft Tissue Losses	Bone Tissue Losses
Caries	Detachment	Horizontal atrophy
Erosion	Pocket	Vertical atrophy
Wear	Inflammation	Osteoporosis
Accident	Hypertrophy	Other pathologic lesions
	Other pathologic lesions	

Functional Losses	Morphology
Malposition	Tooth form
Adjacent teeth missing	Crown form
Opposing teeth missing	Pulp form
Overstress	Developmental excellence

The conditions considered are shown in Table 1.

In the rating of a case, it is necessary to have authentic and clearly diagnostic roentgenograms. This makes it impractical for school use and requires too much subjective judgment on the part of the dentist, in addition to the fact that the classification of desirable and undesirable qualities is extremely complicated.

XI. "Health Index of Teeth." (East and Pohlen.[11])

These authors suggest that to represent the dental health of children in terms of decayed, missing and filled teeth per hundred persons examined is logically and biologically unsound.

They emphasize that the DMF (decayed, missing and filled) ratio, as it is commonly used, is a coordinated relationship similar to demographic relations; e. g., the number of new born to a given population. Contrasted to the coordinated is the genetic relationship, which accounts for events and their effects within a consistent sample. They say,

> In dental statistics, the genetic relationship should compare the number of DMF teeth with the number of teeth that have remained sound in a given sample, or the number of children who actually have DMF teeth with the number of children who possibly could have DMF teeth. To combine the two is not permissible.

Their dental health index represents the number of teeth, per hundred teeth examined, that are not decayed, missing or filled. The ratio increases and decreases as the DMF increases and decreases.

According to the rate of severity of attack by caries, there are two groups:

1. Those with from one to four decayed permanent teeth.

2. Those with five or more decayed permanent teeth.

Children with moderate caries attack rates (caries probably involving only the first permanent molars) are to be considered apart from those with severe attack rates (those children who probably have or have had caries in teeth other than the first permanent molars).

There is a great deal of logic in their preference for a rate per hundred examined teeth over a rate per hundred examined children and the former can be applied when we are considering the

10. Jensen, A. L.: J.A.D.A., 27:1003-1012, July 1940.

11. East, B. R., and Pohlen, K.: J. D. Res., 20:533-541, December 1941.

same tooth, such as an upper right first molar; but, in considering the four first permanent molars, computation of the rate for, say, the incidence of caries will not present so clear a picture as when the rate for the four first permanent molars is figured on the basis of 100 children.

I question the soundness of the designation of moderate and severe attack rate groups. The incidence and the degree of severity of caries in a moderate or younger group may, in many cases, be more alarming than in the severe or older group.

XII. "A Usable Dental Health Index for Schools." (Turner, Howe and Dick.[12])

These authors recorded data for the four first permanent molars that were either present or lost. Teeth were considered lost if they were previously extracted or had only roots retained in the mouth.

This, the original or forerunner of the survey presented herewith, is essentially the same except that additional data have been recorded in regard to the number of tooth surfaces that are carious and the number of tooth surfaces that have been filled.

These additional data will, I believe, be a better measure of dental health, and I subscribe to the conclusions presented by Knutson and Klein in their studies on tooth mortality[7]:

> Since the proper placement of fillings prevents the extension of decay, it follows that through complete and adequate care the tooth mortality rate may be expected to be considerably reduced in children who may actually have a high incidence of dental caries. Therefore, periodic tooth mortality rates may be used as an index of the adequacy and effectiveness of dental care (fillings) in a specific community, but they should not be considered an index of dental health, since the problem of tooth mortality is only one factor in dental health.

12. Turner, C. E.: Howe, P. E., and Dick, M. J.: J. School Health, 12:1-9, 47-54, January 1942.

Dental Health Capacity and DMF Index of the First Permanent Molars

The following method for scoring the condition of the first permanent molars is presented as a simple and usable index for determining the dental health capacity and DMF (decayed, missing and filled) index of the first permanent molars.

Dental health capacity is defined as the ability or capability of the first permanent molars to function as a biologic unit of the dental mechanism. It represents those first permanent molars that are free of caries or have uncorrected caries (decay) and corrected caries (fillings). The ratio increases or decreases inversely as the DMF index increases or decreases.

The DMF index represents the difference between the dental health capacity and the optimum or maximum dental health capacity and comprises the decayed, missing and filled surfaces of the first permanent molars.

A. Scoring. This is essentially a combination of both a merit and demerit system of values. The following score is given for the symbols used in the examination and described in the text.

OK—10 points. F1—9½ points expressed as 9:5. D1—9 points.

M—0 points. F2—9 points. D2—8 points.

Dx—0 points. F3—8½ points expressed as 8:5. D3—7 points.

F4—8 points. D4—6 points.

F5—7½ points expressed as 7:5. D5—5 points.

All molars have five surfaces; therefore, a tooth free of caries and with no restorative filling is given the score of 10, two points or units for each surface free from the ravages of man (fillings) or the elements (caries).

Missing teeth (m) and teeth decayed beyond repair, extraction indicated (Dx)

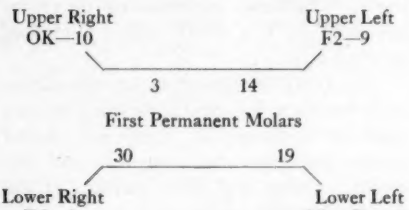
are marked o, representing five lost tooth surfaces, a demerit of two points for each surface lost.

Teeth with surfaces restored by fillings are considered not to be functionally the equal of teeth free from caries, yet superior to teeth that are carious with the carious areas unfilled. It is evident, therefore, that there should be a difference in the values assigned to each.

A tooth surface that is filled is given a demerit of 0.5 unit or point, or a value of 1:5.

A tooth surface that is carious is given a demerit of one unit or point, or a value of 1.

TABLE 2.—SCORING AND COMPUTATION



	Score
Upper right first molar	10
Upper left first molar	9
Lower left first molar	0
Lower right first molar	8
Total	27

Scoring and computation are best explained in Table 2.

The maximum or optimum score possible is 40, representing four perfect first permanent molars (twenty surfaces) with a two point or unit value for each surface.

B. Computations. For the foregoing the equation would be:

27:40 as X:100

$40X = 2700$

$X = 67.5\%$ or actual dental health capacity

Optimum or maximum dental

TABLE 3.—COMPUTATION OF DENTAL HEALTH CAPACITY AND DMF INDEX

Score	Dental Health Capacity	DMF Index
40.0	100.0	0.00
39.5	98.75	1.25
39.0	97.50	2.50
38.5	96.25	3.75
38.0	95.00	5.00
37.5	93.75	6.25
37.0	92.50	7.50
36.5	91.25	8.75
36.0	90.00	10.00
35.5	88.75	11.25
35.0	87.50	12.50
34.5	86.25	13.75
34.0	85.00	15.00
33.5	83.75	16.25
33.0	82.50	17.50
32.5	81.25	18.75
32.0	80.00	20.00
31.5	78.75	21.25
31.0	77.50	22.50
30.5	76.25	23.75
30.0	75.00	25.00
29.5	73.75	26.25
29.0	72.50	27.50
28.5	71.25	28.75
28.0	70.00	30.00
27.5	68.75	31.25
27.0	67.50	32.50
26.5	66.25	33.75
26.0	65.00	35.00
25.5	63.75	36.25
25.0	62.50	37.50
24.5	61.25	38.75
24.0	60.00	40.00
23.5	58.75	41.25
23.0	57.50	42.50
22.5	56.25	43.75
22.0	55.00	45.00
21.5	53.75	46.25
21.0	52.50	47.50
20.5	51.25	48.75
20.0	50.00	50.00
19.5	48.75	51.25
19.0	47.50	52.50
18.5	46.25	53.75
18.0	45.00	55.00
17.5	43.75	56.25
17.0	42.50	57.50
16.5	41.25	58.75
16.0	40.00	60.00
15.5	38.75	61.25
15.0	37.50	62.50
14.5	36.25	63.75
14.0	35.00	65.00
13.5	33.75	66.25
13.0	32.50	67.50

TABLE 3 *(cont.)*

Score	Dental Health Capacity	DMF Index
12.5	31.25	68.75
12.0	30.00	70.00
11.5	28.75	71.25
11.0	27.50	72.50
10.5	26.25	73.75
10.0	25.00	75.00
9.5	23.75	76.25
9.0	22.50	77.50
8.5	21.25	78.75
8.0	20.00	80.00
7.5	18.75	81.25
7.0	17.50	82.50
6.5	16.25	83.75
6.0	15.00	85.00
5.5	13.75	86.25
5.0	12.50	87.50

health capacity 100.0%
Actual dental health capacity 67.5%
DMF index 32.5%

The score for each child would be sufficient for the purpose of comparing different age, grade and sex groups or evaluating school systems and school dental programs, but if the dental health capacity and DMF index is wanted, Table 3 will furnish the desired information.

Conclusion

I recommend the annual scoring of the first permanent molars of elementary school children and the use of the dental health capacity and the DMF index, as described in the text, to be supplemented by a periodic and complete dental survey by competent dentists at least once in five years. The computed indices for the different age and sex groups would serve to clarify the dental status of the children and would show whether there has been any improvement in dental health from year to year in individual children. It is a reliable and easy means of comparing the school children of one community with those of another.

DENTAL HEALTH EDUCATION IN A SCHOOL HEALTH PROGRAM

Harold Berk, D.D.S., and Raeburn R. Davenport,† D.M.D., Boston, Mass.*

Walpole, a town of 8,000 inhabitants, was one of the first towns in Massachusetts to establish a school dental clinic. Until 1942, all school children through the sixth grade were cared for by this clinic. At this time, a state well-child survey showed that an increase in caries and its sequelae occurred from the sixth grade through the last year in high school. In order to remedy this condition, it was suggested that an educational program for these grades be instituted. Such a program would acquaint the students with their own dental problems and ways and means of attaining dental health.

The personnel of this program consisted of two dentists, each of whom gave one morning a week, and one hygienist employed full time. The equipment was that of the existing dental clinics, to which was added an x-ray machine purchased through a town appropriation.

The educational program was carried out in two parts. First, in conjunction with the physical fitness program, the teeth of all the junior and senior stu-

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†President, Massachusetts unit, American Society of Dentistry for Children.

dents were x-rayed. These x-ray examinations were used as a basis for the discussions on dental health. The dentist held an informal conference with each class in the presence of the physical fitness instructor, the school nurse and the hygienist. An attempt was made to correlate the condition of the mouth with nutrition and the health of the body as a whole. Visual aids such as charts, x-ray films, slides and posters were used, and material that can be obtained from the American Dental Association, United States and state departments of agriculture, local state departments of public health, local dairy councils, the *Dental Digest* and other sources.

Second, in conjunction with the departments of home economics, botany, English, chemistry, art and biology, health education was stressed. The home economics department concentrated its teaching for two weeks on general nutrition, adequate diets and physiology with relation to teeth.

In the botany department, it was demonstrated in transplant boxes that cabbage and lettuce seeds planted in sand with no feeding except water and sunshine will grow through the seedling stage, but will wither and die before maturing. Given chemicals in addition, other seeds from the same packets will mature successfully. Thus, the point was stressed that good nutrition is essential for adequate growth and maintenance of good health. These experimentally grown plants, when the difference in them was evident, were displayed in the window of a local hardware store as part of a victory garden exhibit.

In the English department, the students wrote compositions on subjects related to dental health. Source material was obtained from reprints and texts.

In the chemistry department, a simple experiment was carried out. Saliva was procured from students, who chewed paraffin for stimulation. This saliva was added to three beakers, each containing a tooth. To the second beaker, sugar was added, and to the third beaker, a candy bar. After three weeks, decalcification was evident in the teeth in the second and third beakers. This experiment demonstrated to the students the effect of eating sugar and candy.

The art department introduced dental health by sponsoring a poster contest. Prize money was donated by local service clubs for the best three posters. The judges were a representative of the service clubs, an art teacher not connected with any local school, a commercial artist and a teacher. The posters were later exhibited in local store windows. During health week, a grocery store featured an exhibit on foods for dental health, accompanied by a poster made by one of the students.

The biology department performed a nutritional experiment with two white rats. The two rats, named Okie and Cokie, were litter brothers of the same size and weight. Okie was fed a well-balanced diet, consisting of fruits, vegetables, dark bread with butter, whole grain cereals, eggs and milk. This diet was compared to well-selected cafeteria or home lunches. Cokie had a diet comparable to poorly chosen lunches, consisting of cake, candy, doughnuts, cookies, white bread and carbonated beverages. In a relatively short time, a distinct difference was noted in the rats. Okie became a large, active, alert, good-natured pet with bright eyes and shiny hair. Cokie was stunted in growth, sleepy eyed and coarse haired. First, he was irritable. Later, he became lethargic. This experiment was carried out in a local drugstore window so as to develop interest throughout the community. When the results of their respective diets became obvious, the rats were shown in every school room. All children in the first to sixth grades wrote compositions or drew pictures of Okie and Cokie.

This is a sample of what one of the younger children wrote: "Okie and

Cokie were two mices. Cokie eats sweet things. He does not eat good things. Okie he does not eat sweet things. He eats good things. Cokie is a skinnie rat. Okie is a fat rat."

The enthusiasm shown by the students as well as by the community in this program was most gratifying. This kind of program with modifications could be established in any community regardless of its size. Dental societies can aid in promoting such a program by offering the necessary material and advisory service. Facilities within the community—store windows, the local newspapers, the health department and civic organizations—can be used to good advantage.

In Walpole, the success of the program was brought about by the cooperation of local, civic and lay authorities, the school committee, the superintendent of schools, principals and teachers. The need for an educational program was discussed with the student council, which, in turn, was able to inspire interest in the student body. In this way, the project became a cooperative venture between the school authorities and the students, with the demand rising from the students as they recognized the need for the program.

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DENTISTRY IN THE INDUSTRIAL HEALTH PROGRAM*

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Dental health, in its fullest measure, is enjoyed by relatively few Americans and less than 25 per cent take adequate mouth hygienic measures or avail themselves of necessary dental care. Three-fourths of the people are indifferent to dental health care and, as a result, the vast majority suffer from gross dental neglect.

This situation, long known to dental and public health authorities, was revealed in the early days of selective service, by the great number of rejections due to dental conditions. In the armed forces, widespread dental neglect produced an acute manpower problem, necessitating dental rehabilitation requiring the services of nearly one-third of the nation's dentists.

In industry, the accumulation of years of dental neglect among workers has resulted in a major industrial health problem, causing inestimable manpower and man-hour losses, manifested by industrial inefficiency, absenteeism and production delay, and a factor in industrial accidents.

The industrial physician, striving to improve the physical well-being of the worker, has generally recognized the relationship of dental disease to industrial ill health, but it was not until the war was upon us, when employment was enormously expanded and industry was faced with a critical manpower situation, that the causes of absenteeism and the sources of industrial ill-health came into sharp focus.

A loss of 350,000,000 man-days to American industry yearly as the result of illness in this most critical war production period has been reported by the National Industrial Conference Board. This astronomical figure does not give a complete picture of the manpower loss due to ill health when the numerous no-time-loss ailments are taken into account.

*Read before the Industrial Health Section, Thirty-Third National Safety Congress, Chicago, Ill., October 4, 1944.

The many chronic illnesses, as well as the more acute ailments that do not remove the worker from his job are the cause of a manpower loss and reduced industrial efficiency that it is impossible to estimate for statistical study.

Among the varied complex factors in the health of all workers, such as working conditions, sanitation, nutrition and housing, dental ill health is most constant and affects far greater numbers in all categories of occupation and industry. The incidence of dental sepsis among the white collar workers is probably as uniformly high as among mechanics or unskilled laborers and relatively the same in all branches of industry.

The intimate relationship of dental infection and ill health has been so voluminously reported in medical literature that any review or elaboration of the subject before this industrial health group is unwarranted, other than to reaffirm the conclusion of many observers by stating that a high level of dental health is of paramount importance to the maintenance of a proportionately high level of general physical well-being.

A veteran industrial physician writes:

> From an experience of twenty-five years in industrial medicine, it is my belief that dental sepsis is one of the most prolific sources of ill health among working men. Arthritis, neuritis, chronic infections of the gastrointestinal tract, chronic infections of the urinary tract, eye infections and often anemia and general debility have definitely been traced to infections about the teeth, and relieved or cured by the removal of such infections. I consider the work of the industrial dentist one of utmost importance in the prevention of loss of time from ill health in an industrial organization.

Dental infection, the most common and widespread disease entity afflicting the human family, unlike the common cold and many other disease processes, is persistent and progressive, and will respond to treatment or can be eliminated only by dental intervention.

The effects of cumulative dental sepsis, constantly and insidiously undermining the health of the majority of industrial workers, cannot be fully evaluated in terms of manpower or man-hour losses, but it is evident that no worker can retain his health or productive effectiveness indefinitely or remain a safe worker with a mouth harboring extensive dental infection.

In the broad field of industrial safety, many accidents are reported which, upon investigation, are recorded as due to man failure because the causes are intangible or obscure. The worker, for some unknown reason, failed to react in the usual manner, or his actions were unorthodox, resulting in an accident. Nervous disorders, mental aberrations and physical impairment, caused or aggravated by dental sepsis, are yet to be seriously considered as some of the obscure or intangible factors in industrial accidents.

The frequent exacerbation of advanced dental lesions, causing unbearable pain, often developing into fulminating dental infection, are not only a critical industrial health problem, but are also of major significance to industrial safety. Pain and sleeplessness, with subsequent fatigue and mental distraction, are conditions that make the victims exceptionally vulnerable to industrial accidents. The worker, suffering from an agonizing toothache for hours, sometimes days, and attempting to stay on the job, using high speed tools or engaged at some hazardous task, is endangering not only his own safety, but also that of his fellow workmen.

Some time ago, a radio program on industrial safety depicted the sudden death of a workman as due to mental distraction following a family quarrel involving his mother-in-law and occurring at home the evening before.

It can be safely concluded that toothache and ensuing mental distraction occur with much greater frequency and

severity than does mother-in-law trouble.

Recognizing the potential safety hazard of untreated dental lesions, aviation, both military and commercial, demands a high standard of dental health for operational personnel before entrusting the safety of others and costly equipment to their care. From the standpoint of industrial safety, the dental health of the worker, in many fields of occupation, is as essential to safety as is the health of the pilot and copilot, upon whom the safety of others depends.

Industry has an enormous stake in the dental welfare of its workers, the majority of whom can be classified as dentally septic.

Industry has a profound interest in the worker partially incapacitated by one of the many physical ailments caused or aggravated by dental infection. The worker often attributes this type of incapacity to occupational circumstance, when probably it is a local disturbance of systemic origin that will respond to elimination of focal infection.

Industry has a profound interest in the worker whose employment has been interrupted by illness, possibly caused or complicated by dental infection. This is particularly true of many chronic ailments that cause recurrent periods of absenteeism and that improve only after dental infection has been eliminated.

Industry has a profound interest in the worker who, after years of training and experience, and having reached the peak of industrial effectiveness, shows signs of physical deterioration or symptoms of degenerative disease processes common to senescence, perhaps having, through the years, given little heed to the need for dental care. If this period of high productive efficiency can be extended, and it may be by health measures, the economic value to industry, the worker and society is incalculable and the cost of health service, including dental, to industry will be relatively insignificant.

Industry has a profound interest in the dental health of the worker who is neither well or ill, but weary or stale, going about his work in a half-hearted, disinterested manner because of fatigue, general debility and malaise resulting from toxicosis generated by dental infection.

Industry has a profound interest in the dental welfare of the younger worker whose industrial career may be adversely affected by dental neglect and subsequent dental infection. It is to youth in industry that, dentally, an ounce of prevention will be worth many a pound of cure.

The question then presents itself as to what measures industry can undertake to improve the state of dental health of its employes without committing itself to the stupendous, if not impossible, task of dental rehabilitation.

Industry could not, by any stretch of the imagination, attempt the colossal task of dental rehabilitation of all its workers. Neither is it the prerogative or obligation of industry to do so. The service and cooperation of the entire dental profession would be necessary to restore industrial dental health to even a modest level.

Industrial health programs can be augmented by dental health service that meets industrial health needs in providing remedial, prophylactic and protective dental health service without invading the field of restorative dentistry or assuming the responsibility of dental rehabilitation.

Such service should include examinations, clinical and roentgenographic, diagnosis, emergency dental care, the treatment and elimination of dental sepsis, the emergency treatment of industrial injuries, the recognition and treatment of the oral manifestations of occupational diseases peculiar to certain industries and dental health education. These services adequately implement general industrial health programs and are adaptable to industrial organization.

All dental procedures requiring numerous and prolonged sittings are less adaptable to industrial organization and would unnecessarily disrupt production and defeat the primary objective of "keeping the man on the job."

Dental rehabilitation requiring extensive restorative dental operations is invariably time consuming, extending over long periods, and can be satisfactorily accomplished only during the worker's leisure hours through the cooperation of the local dental practitioners. Restorative dental procedures are not only time consuming, but also demand unusual individual skill and responsibility. Such services can be rendered only on an entirely voluntary basis, whereon the patient has free choice of dentist and the practitioner in turn assumes a personal obligation and responsibility.

The practice of dentistry does not lend itself to mass production methods; therefore, any attempt to expand industrial dental care beyond preventive, remedial or emergency dental health services within industry is not only impracticable and noneconomic, but also inconceivable.

Industrial dental health service should make available to all employes roentgenographic and clinical examinations with detailed diagnosis, so that the worker may be apprised of his dental health needs and encouraged to secure necessary dental care. In such industries, if employment is relatively stable, preemployment and periodic examinations of all employes would tend to maintain a high level of dental health. However, in many industries, if the labor turnover is large, complete dental examinations of all employes is less feasible. The availability of such service would undoubtedly prove its worth in developing a higher standard of dental health. Routine dental x-ray and clinical examinations of all medical cases in which dental infection may be a cause or a complication, and the subsequent treatment and elimination of dental foci would hasten recovery and reduce recurrence of many ailments that are a constant source of concern to industrial medicine, and the cause of considerable absenteeism as well as physical impairment.

Emergency dental care in an industrial health program greatly reduces time loss, the safety hazard and accident potential and promptly restores industrial effectiveness, by giving emergency treatment and immediate relief to the worker suffering from an acute and painful dental lesion. Toothache, the most common dental complaint of the worker, usually results from advanced tooth decay. The degree of pain varies with the inflamed or infected condition of the tooth or of the teeth involved. Some men will tolerate days, even weeks of pain or discomfort before seeking dental relief. After one or several sleepless nights, relief is sought. Owing to fatigue and mental distraction, the worker is inefficient and a menace to industrial safety. Given prompt relief at the industrial infirmary, the worker returns to his duties with a minimum time loss. Grateful for the relief given, he is usually in a receptive mood for advice and sorely needed information on dental health.

Though the incidence of toothache is high, there are other dental conditions of greater importance to industrial health and that require emergency treatment and dental supervision. Acute dental infection, abscess, neuralgia, Vincent's infection, gingivitis and stomatitis and other forms of dental sepsis come in this category. Widespread neglect and the lack of dental care are the cause of extensive advanced dental infection culminating in acute dental conditions demanding immediate dental intervention. The treatment of these infections constitute a major part of industrial dental service and often require the closest collaboration with industrial medicine. Many of these cases are presented in the advanced stages, with the victim

acutely ill although attempting to work. With prompt care available and emergency treatment instituted, these infections can often be aborted or the infectious process terminated with a minimum of incapacity or time loss. The acute or subacute dental infections often account for acute disturbances in other tissues or organs of the body, by metastatic invasion or elective localization. These disturbances are relieved or cleared up with the treatment or eradication of the dental focus.

Treatment and Elimination of Dental Sepsis

After the roentgenographic and clinical examination, with careful diagnosis, the worker should be apprised of his dental health needs and encouraged to have all hopelessly infected teeth removed. Carious teeth that can be restored and pyorrheic teeth that can be maintained should be retained and the patient advised to secure such treatment as will inhibit the disease.

The treatment and elimination of dental sepsis are probably the most beneficial and effective health services rendered in the industrial dental program. For the younger worker, simple operative procedures and prophylactic measures are usually adequate for maintenance of dental health. If sepsis is more extensive, the removal of some and, less frequently, all teeth may be indicated. The patient should then be referred to the private practitioner for restorative and maintenance care.

In the older patient, frequently presenting a medical case, with advanced dental infection, removal of most, and too often all, teeth is necessary to restore a healthy oral condition.

Dental sepsis resulting in infections of the gums and surrounding tissues, such as Vincent's infection, is of utmost significance to industrial health because of possible contagion. Diagnosis and therapy frequently require the combined services of the industrial physician and the dentist to arrest the infection and hasten recovery. Some of the infections suggesting dental sepsis as their origin are likely to be oral manifestations of systemic disease processes induced by blood dyscrasia, metabolic disorder, malnutrition and avitaminosis, demanding careful study and the cooperation of the physician and the dentist.

Industrial Injuries

The most necessary service rendered in an industrial dental program is treatment of injuries involving the teeth and adjacent oral tissues. The frequency with which these injuries occur makes it highly desirable to have available emergency dental care. Invariably, injuries are not confined to the teeth, usually being complicated by contusions and lacerations of the face and mouth, sometimes involving the supporting bone structures. The successful treatment of many of these injuries requires the closest cooperation between the surgeon and the dentist. In the more extensive industrial injuries of the head, body and extremities in which dental trauma also occurs, emergency dental intervention can do much to relieve the victim and to provide sufficient comfort to make surgical treatment possible.

Postoperative dental care following emergency dental and surgical treatment of industrial injuries resulting in the loss of teeth or of parts thereof, and occasionally of supporting dental structures requiring prosthetic and restorative procedures for oral reconstruction, should be left to the dentist of the patient's choice.

Oral reconstruction usually demands extraordinary skill and involves a responsibility that only the private practitioner, whose cooperation is then highly desirable, can assume.

Occupational Diseases

In the industrial health program, den-

tistry can be of immense value in dealing with the problem of occupational disease affecting workers in numerous industries. The recognition and palliative treatment of the oral manifestations of occupational disease peculiar to certain industries demand special study and careful observation by the industrial dentist, collaborating with the industrial physician and hygienist. With proper dental supervision, early recognition and timely treatment can greatly reduce the extent and period of morbidity and economic loss accruing from many of these ailments.

Some occupational disease processes are purely dental, manifested by abrasion, erosion, decalcification of the teeth and irritation and inflammation of the soft tissues, which dental supervision can detect in their incipiency, by proper corrective measures preventing further destruction and ultimate sepsis with ensuing tooth loss.

The development of industrial medicine and hygiene to meet the health and safety needs of an ever-expanding industrial economy has been phenomenal, owing largely to the unceasing effort and the far-sighted guidance of the National Safety Council, the Industrial Hygiene Foundation and groups that are affiliated with them.

To maintain the maximum manpower resources and to attain an optimum of industrial health and physical fitness, the dental health status of the worker demands paramount consideration, and dentistry should be included in any comprehensive industrial health program.

Although the development and extension of industrial dental health service cannot be rapid owing to planning and personnel requirements, there is much that industry can do to improve the dental health condition of its workers. Industry, in general, can subscribe to a critically needed program of dental health education.

Dental Health Education

All efforts to elevate the standard of dental health among workers through augmenting industrial health programs by including dental service will be nullified to a large extent by the lack of or indifference to dental health education. Until the beneficiaries of all these efforts are educated in the fundamentals of dental health and are willing to accept dental care, practice strict mouth hygiene and, above all, observe certain dietary restrictions, the desired results of prevention and health conservation will be far from attainable.

Dental health cannot be acquired in a dental chair alone. Dental health for all the people, including 50,000,000 or more industrial workers, can be attained and maintained only by proper nutrition, supplemented by mouth hygiene. Dental science can only treat and overcome dental infection and restore the individual to optimum dental health.

Virtually all investigations into the etiology of dental caries point to the fermentation of food débris, lodged on the less accessible tooth surfaces and in the sulci and fissures. Foods with a high carbohydrate content, particularly the free sugars, which are rapidly converted into acids, are held responsible for widespread dental disease and the only defensive measure is thorough cleansing of the tooth surfaces shortly after eating. Food rich in minerals and of high vitamin content are stressed as the builders of sound teeth. The presence of fluorine in minute quantities in food and drinking water has recently been greatly publicized as affording caries resistant properties. In spite of tremendous scientific advancement in the treatment of human ills, solution of the problem of tooth decay still rests largely on the work of Miller and Black a half century ago and, at this late date, the only improvement in dental health for all people must come through education, with emphasis on diet and hygiene.

The free and unregimented worker, like all other Americans endowed with the inalienable right to life, liberty and the pursuit of happiness, will choose his food wisely or unwisely to please and satisfy his appetite. Because his grandfather had no apparent tooth trouble and never used a toothbrush, he will brush his teeth as he thinks fit and probably not at all. He will spend his money to secure sorely needed dental care only after all other human desires and fancies have been satisfied, and then will insist on a choice of dentist and on the types of service that he thinks are indicated, often becoming the gullible victim of the charlatan.

Dental health education will be rejected by large numbers, and only the persistent administration of it in elemental doses over periods of time will bear fruit.

The industrial nutritionist can also be of tremendous aid in improving the dental health of the worker, through education and feeding supervision. The nutritionist should always be mindful of industrial health in the selection of food and the preparation of menus. The protective foods, of high mineral and vitamin content, are also of utmost value to dental health. The American diet is invariably of high caloric value, owing to an excess of carbohydrates, and low in mineral and natural vitamins, owing to modes of preparation and to refinement. Nutrition is more important to dental health than adequate diet. The eating habits of people are not easily changed, and it is not very likely that man will return to the more simple natural food of his ancestors. Therefore, to overcome the harmful effects of modern diet and its excesses, it is necessary to compensate with strict hygienic measures. The toothbrush is a symbol of present-day civilization as is the bath tub, the candy bar and the soft drink. As long as workers are encouraged to eat more candy to provide more energy and to drink highly sweetened acidulated soft drinks to be refreshed, they certainly should be admonished to brush their teeth thoroughly with an alkaline dentifrice before dental decalcification occurs. It can be stated without serious refutation that the proper brushing of teeth with an inexpensive alkaline dentifrice, such as sodium bicarbonate, will do more to promote dental health than any other single measure. Mouth hygiene is necessary to dental health, and only the refreshed feeling of a well-cleansed mouth will create an interest in dental health.

The indifference, the ignorance, the fear and the procrastination that bar the way to securing sorely needed dental care can be overcome only by education.

Though the physical fitness of all employes is of utmost concern to industry, the responsibility of health education cannot be charged to industry. The responsibility for the personal habits and hygiene of such a large population must rest with society.

Dental health education can be extended to all workers only by the effective cooperation of industry, industrial health authorities, the dental profession and the public health agencies. Limited educational programs have been undertaken by certain industries and dental hygiene organizations. To attain maximum effectiveness, an educational campaign should be nation wide in scope, with the National Safety Council, the American Dental Association, the Industrial Hygiene Foundation, the Industrial Physicians and Surgeons, the industrial hygiene divisions of the federal, state and local public health agencies and all other industrial health and dental hygiene groups actively sponsoring and supporting well-directed programs.

The National Safety Council, with its elaborate educational facilities, could render a timely and invaluable service to industrial health and safety in the dissemination of authoritative dental health knowledge, formulated and pre-

pared by the American Dental Association and other institutions interested in dental health education.

Optimum dental health for all industrial workers and, with it, the solution of the dental health problem can be attained only by the indoctrination of the worker's mind, through education whereby dental health will frequently be sought on the initiative of the individual.

Dentistry, represented by the American Dental Association and its component state and local societies, cognizant of the importance of dental health to general health and physical fitness, and aware of the responsibility and opportunity of providing adequate dental care and health education to all people, is desirous of securing the cooperation of industry and the industrial health authorities in the improvement of industrial dental health, and the conservation of manpower, that industrial efficiency may be increased and safety enhanced, that absenteeism and man-hour losses may be reduced during the war period and in the era of the postwar industrial economy.

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INDUSTRIAL DENTISTRY*

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Most public health administrators hold that specialists fit better into the over-all activities of the department if they have had introductory experience or training in as many phases of public health as possible. Likewise, it seems reasonable that dentists working in industry would find it helpful to be familiar with the problems and activities of other professions practicing in the same field.

At the outset, it may be well to consider a definition of industrial dentistry. The following is offered, not because it is complete or entirely satisfactory, but because it has been adopted by a recognized body, the Council on Dental Health of the American Dental Association:

> Industrial dentistry is that specialty of dentistry which is concerned with the dental health of the industrial worker as it affects or is affected by his general health or his working environment.

Recently, the *New York Times* and the *New York Herald Tribune* published editorials supporting the proposition that an urgent need exists for wider distribution of all types of health services. These publications are reliable, but conservative interpreters of informed public opinion. The *Herald Tribune* quoted a former president of the American Medical Association as follows:

> The operation of these programs (industrial, medical and hospitalization plans) has made manifest an almost universal need and a clearly crystallized demand for protection of workers on a voluntary prepayment basis against financial loss through illness and for hospitalization and surgical care costs for dependents.

Dentistry cannot escape its opportunity to share in the inevitable expansion of all types of health service, including industrial dental care. It is against this contemporary prospect that past experiences, failures and achievements in industrial dentistry should be considered. During the past two or three years, there

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has been an upturn in industrial dental care. Many concerns have installed and others contemplate installing programs. There may be a tendency to regard this as a new and novel professional activity, but the dental literature shows as great if not greater interest and activity in this type of dental service twenty-five to thirty years ago.

As early as 1847, the Great Western Railway of England and its employes organized an association to provide medical and surgical care to members at fixed and greatly reduced costs. The company and its employes shared the costs equally. In 1887, fifty-seven years ago, a dental division was added to the association's services. The dental service covered the entire range of dental operations and replacements then known. In Brazil, a soap manufacturing concern established a dental service for its employes as early as 1900.

In the United States, the Barber Match Company was probably the first organization to have a dental program for employes. Their service began in 1890. Another pioneer in this field was the Armstrong Cork Company. The Armstrong program gave dental care without cost to all its employes. One of the oldest continuous programs is that of the Metropolitan Life Insurance Company of New York City. The Metropolitan project, established in 1915, has made notable contributions, particularly in the statistical field. The Union Health Center of New York City had a low cost dental service for industrial workers as early as 1918. By 1918, there were at least twenty-five factories with dental clinics on their premises in the State of Ohio alone. The *Dental Cosmos* of September 1920 reported that there were approximately 400 known industrial concerns in the United States with dental programs of some sort.

It would serve no useful purpose to expand the list of organizations that had industrial dental programs prior to 1925. Enough has been offered to indicate that, during the period from 1900 to 1925, there was an aroused interest in dental health for workers among members of the health professions, management and labor.

Supporting evidence of the extensive interest and activity in industrial dentistry among the dental profession is furnished by the founding, in 1918, of the National Association of Industrial Dental Surgeons. The organization held semi-annual meetings for several years. Finally, all reference to the group disappears from the literature.

After the period of expansion, 1900 to 1925, the opposite trend began. The decline reached such proportions by 1930 that a committee of the American Dental Association, which had set out to study industrial dental programs, reported ". . . the years 1930-1931 presented a very bad period in which to study industrial service, for the subject appeared to be dissolving about the investigator." Although the committee's questionnaire was given national circulation, only eighty-four institutions replied. Of these, twenty-one informed the committee that their dental services had been discontinued. Several others reported that they proposed to curtail their programs.

What were the circumstances and events associated with the rise and decline of industrial dentistry in the United States? It is difficult, if not impossible, to present definite, convincing evidence in this regard. The following opinions and speculations are offered for what they are worth. Perhaps they may assist in evaluating conditions that serve to maintain the present upturn and prevent similar reverses following the present period of full employment and easy money.

One possible factor in discontinuance of industrial programs was the means often used to induce the management to install them. Frequently, an official of

a concern had been persuaded by his family dentist to take the step. The dentist was enthusiastic and the company official had agreed against his better judgment. Usually, the dentist who did the "selling" continued his private practice while the industrial project was entrusted to a younger man, with little if any administrative experience. Fortunately, during the present period, there is a minimum of that type of promotion.

A second factor in the decline of industrial dental service is related to the economic reversals of the late twenties. During that period, employers and employes alike were plagued with hard economic facts. There was a violent shrinkage of the means to keep manufacturing establishments in operation. All projects and expenditures considered unessential were discarded. Any program or activity that could not demonstrate its worth was discontinued. Many industrial dental programs were abandoned at that time and on that basis. Probably, the principal reason for this unfortunate situation was that data had not been collected in sufficient number to demonstrate the benefits of dental service.

A third possible factor in the discarding of industrial dental service concerns the relation of the dentist to the industrial organization. A plant large enough to support a dental service is highly organized. There are various divisions, activities and interests functioning together under the direction of management. The dentist is by training and tradition an individualist. If the industrial dentist confined his attention entirely to his relatively narrow field, if he neglected to familiarize himself with the over-all problems of the organization of which he was a part, if he failed to acquaint management with the significance and progress of the dental program or to gain the interest and support of the medical and other professional personnel, he probably was unable to function so that his work constituted one of the organized activities.

That some industrial dentists were remiss in acquainting themselves with the over-all problems of their plants is indicated by the statement of a dental leader of the period. He advised that "the dentist is not concerned with the conditions under which men work, such as ventilation, illumination, sanitation, safety devices and so forth." It is true that the industrial dentist is not directly responsible for the detection, prevention and correction of the cited health hazards; but such indifference to them as is suggested by the dentist quoted certainly would not be conducive to the most cordial relations between the dentist and others concerned with the industrial health program. The industrial dentist should be familiar with all health hazards of his plant and should be prepared to discuss them intelligently with the other members of the organization.

DENTAL SERVICES AND DENTAL PERSONNEL IN STATE HEALTH DEPARTMENTS

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Current trends in socio-economics, health legislation and public health practice indicate that state health departments will have an increasingly important role, and perhaps new responsibilities, in the administration of certain types of health services. It seems desirable and timely, therefore, to consider present-day public health philosophies and the dental facilities of state health departments.

History

The public health service performed by official state health agencies has been greatly increased and has undergone many changes since the first state board of health was organized in Massachusetts, in 1869. In early years, the duties of health departments were limited to the promotion of community cleanliness, the removal of dead bodies, the construction of privies, quarantine and the regulation of slaughter houses, public baths and pigsties. Gradually, these services were extended to include the construction of common sewers, maintenance of pure water supplies, attempts at communicable disease control and census taking.

Up to this point, the duties of the health department were limited to a broad sanitation service. The concept of protecting the health of the community by providing service to the individual was first established when vaccination was adopted as a public health practice. Since that time, the rendering of personal service by a state health agency has continued to be a controversial issue. With newer knowledge in the prevention and treatment of disease, specialists in the various fields were added to the staffs of health departments. The physician, nurse, bacteriologist, sanitary engineer, vital statistician, epidemiologist and health educator all found a place in a rapidly growing public service. Thus, it was inevitable that dentistry should eventually become another specialty in public health practice.

It is difficult to determine from the literature just when dentistry was first introduced into the field of community health service. Undoubtedly, Alfred C. Fones had much to do with this new movement when he proposed the employment of dental hygienists,[1] as did Willis A. Sutton,[2] a school administrator in Atlanta, Ga. The North Carolina State Health Department was the first to employ dentists (1918). North Carolina was also the first state to have dentistry represented on the state board of health and the first to require by law that a dentist be appointed to every county board of health.[3]

Definitions

In order to place dentistry in proper focus in the public health picture, it is necessary to look to specialists in that

1. Fones, A. C.: Origin and History of Dental Hygienist Movement. J.A.D.A. 13: 1816, March 1926.

2. Sutton, W. A.: Health and Education. J.A.D.A. 12:273, March 1925.

3. Salzmann, J. A: Principles and Practice of Public Health Dentistry. Boston: Stratford Co., 1937.

field for definitions. Authorities agree in general terms on the meaning of public health and on the fundamental philosophy of public health administration. However, the technics and scope of public health service rendered by state and local health agencies are in a constant state of change.

Winslow's definition of public health is very broad: "Public health is the art and science of preventing disease, prolonging life and promoting physical and mental efficiency through organized community effort." [4] Mustard's definition is more specific: "Public health may be regarded as that body of knowledge and those practices that contribute to health in the aggregate through either prevention or curative measures, or both." [5]

According to this concept, public health is promoted through organized effort in which the private dentist or physician may or may not render specific service. Again, according to the definitions, public health is an objective. Efforts toward attaining the objective are carried out through public health administration. According to Smillie, "Public health administration is the application of public health principles and technics for the benefit of the community, by official or unofficial organizations." [6]

Administrative principles and technics are constantly being altered or improved to keep pace with the increasing responsibilities of health departments. As Smillie points out, "Much of the present methodology may be discarded in the future, and new and more effective methods will undoubtedly be introduced, when they are shown to be more advantageous than present ones." [6]

Basically, the first function of a state health department is the prevention of disease, but a new concept has developed in recent years; namely, that the individual, as a citizen, has a right to receive treatment from the government if he is otherwise unable to obtain it regardless of the character of his illness. Direct treatment provided by state and local government had its beginning in state eleemosynary and penal institutions, and in clinics for the treatment of venereal diseases. This service has expanded into many other types of treatment facilities, including dental, and in some states to highly technical service such as the preparation and distribution of biologic products and laboratory diagnostic service.

It is impossible to predict to what extent clinic service under the state health department will be expanded. There is considerable evidence that the trend is toward decentralization in public health administration even though the state agency retains supervisory or at least advisory responsibilities. In that case, the provision of dental or medical treatment would be a responsibility of local government rather than one of state government, directly.

Authority

The state health department, which is made up of divisions or bureaus, is the official state health agency in most states. The state board of health is the policy-forming body of the state health department. The duties of the board of health are to advise the state health officers on general policies and to approve plans and budgets of the health department. (In some states, they are called public health council, advisory board or state committee of public health.) It is important to point out that the state is the sovereign power in our present-day system of government. The federal government may advise the state on its internal health affairs and may establish requirements for obtaining federal assistance, but state health authority supersedes

4. Winslow, C. E. A.: Untilled Fields of Public Health. Science 51:23, January 9, 1920.

5. Mustard, H. S.: Introduction to Public Health. New York: Macmillan Co., 1944.

6. Smillie, W. G.: Public Health Administration in United States. New York: Macmillan Co., 1945.

federal authority in state health matters.

Need for Up-to-Date Information

Recent legislative proposals are indicative of an expansion, in the immediate future, of dental health programs administered by official state health agencies.[7] The provisions of the legislation indicate that this expansion will consist chiefly of greater health education activities, investigations in public health methods, epidemiologic studies of dental diseases, experiments in dental caries prevention and dental care for children. To carry out these highly technical functions efficiently, it is obviously important that state health departments have proper dental facilities and properly trained dental personnel working in a stimulating administrative environment.

The American Dental Association took steps in 1938 to secure dental representation on boards of health and to encourage the establishment of separate dental units staffed by trained public health dentists.[8]

In view of these considerations, it seems desirable to study the present status of dental facilities of state health departments by presenting pertinent information obtained recently from these agencies. It should be stated that although county and municipal health departments have an important role in the administration of public health services, no attempt will be made in this paper to include an analysis of these agencies.

Other reports have contained information on this subject, but many of the data have become obsolete. In 1933, the U. S. Public Health Service published the results of a survey of dental health activities in the states.[9] Detailed data were also published by Salzmann, in 1937.[8] The information was brought up to date in 1939 by Cady,[10] and again in 1943 by Mountin and Flook.[11] The data now being presented report the status of dental service and dental personnel as they existed in state health departments in August 1945.

Findings

In nearly all states, the members of state boards of health are appointed by the governor. In Alabama, the medical association is the state board of health,[12] while, in Georgia, the state board of health is appointed by the governor from a list of nominees submitted by the state medical association, state dental association and state pharmaceutic association.[13]

Table 1 contains a list of the state boards or councils of health and the types of membership required by law. The first column of the table lists the number that must be physicians as required by state law; the second lists the number that must be dentists, and the third lists all others required by law. "Others" means members of professions or agencies other than the dental or medical professions as well as unclassified individuals. It will be noted that dentists are serving on boards or councils of health in twenty-four states. The laws of twenty-one states require that one member of the board of health be a dentist. In one of those states (Georgia), two members must be dentists. In three states (Massachusetts, Minnesota, Oklahoma), the governors have appointed

7. Senators Pepper and Aiken Introduce Bill to Provide Grants to States for Dental Programs. J.A.D.A. 32:789-791, June 15, 1945.

8. Trans. A.D.A., 1937, pp. 298-300.

9. Survey of Dental Activities of State Departments and Institutions of United States. Public Health Bull. 227.

10. Cady, F. C.: Dental Health Organization of State Departments of Health of United States. Public Health Bull. 251, 1939.

11. Mountain, J. W. and Flook, Evelyn: Distribution of Health Services in Structure of State Government. Pub. Health Rep. 58:14, April 2, 1943.

12. Public Health Laws. Reprinted from Code of Alabama 1940. Atlanta: Harrison Co., 1941.

13. Georgia Health Laws and Rules and Regulations of State Board of Health.

Table 1.—Membership of State Health Department's Policy Forming or Advisory Body

State	Official Name of State Health Agency	Membership Required by Law			
		Number Physicians Required by Law	Number Dentists Required by Law	Number Others Required by Law	Total Number Required by Law
Alabama	State commission of public health	10			10
Arizona	State board of health	1		2	3
Arkansas	State board of health	7			7
California	State board of health	7	1		8
Colorado	State board of health				9
Connecticut	Public health council	2		4	6
Delaware	State board of health	4	1	3	8
District of Columbia	Commission of District of Columbia			3	3
Florida	State board of health				3
Georgia	State board of health	10	2	2	14
Idaho	State board of public welfare				5
Illinois	Advisory committee	7			7
Indiana	State board of health	3	1	5	9
Iowa	State board of health	5		5	10
Kansas	State board of health	9		1	10
Kentucky	State board of health	8		1	9
Louisiana	State board of health	5	1	2	8
Maine	Advisory council of health and welfare	1	1	5	7
Maryland	State board of health	4	1	4	9
Massachusetts	Public health council	3		4	7*
Michigan	State council of health	4	1		5
Minnesota	State board of health				9*
Mississippi	State board of health	8	1	1	10
Missouri	State board of health	5		2	7
Montana	State board of health	5			5

dentists as members although the statutes do not specifically require that they be dentists.

By summarizing the data presented in Table 2, it will be found that the functions of dental units of state health departments are falling into the established public health pattern. Many state programs which previously were limited to dental health education of the public are now also providing direct treatment to selected individuals. In addition, many of the state health departments are providing laboratory diagnostic tests for the dental profession as an aid in the prevention and treatment of dental disease. With the exception of the examination of Vincent's smears, the latter service is relatively new. The new approach in dental health programs (as is demonstrated by the current practice of including *Lactobacillus acidophilus* counts, fluorine therapy and epidemiologic studies of dental caries as a health department function) indicates quite clearly that dental units in health departments are beginning to adopt fundamental public health methods; that is, preventive practices.

State health departments in thirty-seven states and the District of Columbia (a total of thirty-eight) are promoting dental health programs at the present time. Six state health departments (Arizona, Idaho, Montana, New Mexico, North Dakota and South Dakota) do not carry out dental health activities, while the programs in Arkansas, Nebraska, Vermont, Wisconsin and Wyoming became inactive at the beginning

Table 1.—Membership of State Health Department's Policy Forming or Advisory Body—(Cont.)

State	Official Name of State Health Agency	Membership Required by Law			
		Number Physicians Required by Law	Number Dentists Required by Law	Number Others Required by Law	Total Number Required by Law
Nebraska	Department in governor's cabinet				
Nevada	State board of health	2	1	2	5
New Hampshire	State board of health	3		4	7
New Jersey	State board of health	3	1	8	12
New Mexico	State board of health				
New York	Public health council	2		6	8
North Carolina	State board of health	2	1	6	9
North Dakota	Public health advisory council	1	1	3	5
Ohio	Public health council	3		3	6
Oklahoma	State board of health	5		4	9*
Oregon	State board of health	7	1	1	9
Pennsylvania	Advisory health board	4	1	2	7
Rhode Island	Advisory council				5
South Carolina	State board of health	5	1	1	7
South Dakota	State board of health	4		1	5
Tennessee	Public health council	6	1	2	9
Texas	State board of health	6	1	2	9
Utah	State board of health	4		3	7
Vermont	State board of health				3
Virginia	State board of health	2	1	4	7
Washington	State board of health	1		4	5
West Virginia	Public health council	7	1		8
Wisconsin	State board of health				7
Wyoming	State board of health	4	1		5

*Dentist currently serving on board of health though the law does not require that he be a dentist in order to serve.

of the war pending reemployment of dental personnel.

The size of the dental health problem demands that dental units of health departments be established on the same administrative plane as other divisions or bureaus. For a number of years, the promotion of dental health in nearly all state health departments was carried out by a dental unit of the maternal and child hygiene division. This arrangement was based mainly on the fact that dental health programs were organized exclusively for children, and dentists with training and experience in public health practice were not available to assume the administrative responsibilities of a separate division. Experience has shown that the establishment of a separate dental division will permit a wider scope of action in the generalized health program and will tend to establish an *esprit de corps* among dental staff members, which, in turn, encourages more efficient service.

Of the thirty-eight state health departments which maintain dental activities at the present time, twenty-eight, or 74 per cent, have established separate dental divisions or bureaus. The legislatures in three other states (Montana, South Dakota and Wyoming) have enacted laws authorizing the establishment of separate dental divisions, but further action is being delayed until qualified personnel can be obtained. The dental units in ten states are subsections of maternal and child hygiene divisions or are divi-

Table 2.—Organization of Dental Units and

Facilities and Activities	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa
Does the agency promote a dental health program?	X	O	I†	X	X	X	X	X	X	X	O	X	X	X
Is dental unit a separate division or bureau?	O			O	X	O	X	X	O	X		X	X	X
If not a separate division or bureau, under what division is it operated?	MC			MC		MC			MC					
Is dental unit under supervision of a dentist?	X			V	X	X	O	X	X	X		X	X	X
Does state health agency provide:														
(1) Dental health education activities	X			X	X	X	X	X	X	X		X	X	X
(2) Dental treatment services for adults	X[1]			X[1]	X			X[2]	X[1]	X[1]		X		
(3) Dental treatment services for children	X			X	X	X		X	X	X		X	X	X
(a) in centralized clinics	X				X			X		X		X	X	
(b) in mobile clinics	X			X					X				X	
(c) in private dental offices				X	X	X						X		X
(4) Dental diagnostic services														
(a) dental examination or inspection of children	X			X	X	X	X	X				X	X	X
(b) dental examination or inspection of adults	X[1]			X[1]	X[1-5]	X	X	X[2]				X[1-3]		
(c) Laboratory services:														
Saliva specimens					X	X	X	X		X			X	X
Vincent's smears	X				X	X	X	X		X		X	X	X
Biopsy										X				
(d) Other diagnostic services				X[R]				X[R]						

*X, yes; O, no; I, inactive; V, vacancy; MC, maternity and child health; DL, division of local health services; LH, local health administration; DC, division of county health work; OR, orthodontia; †, dental health activities suspended pending reemployment of dental personnel; ‡, new state law passed

sions of local health administration.

With only two exceptions (Delaware and Mississippi), all state dental programs are under the immediate supervision of a dentist. In two other states, in addition to the five states in which the dental programs are temporarily inactive, vacancies exist in the state dental directorship.

Line 5, Table 2, indicates clearly that dental health education projects continue to be the major activity of dental health programs. This is the only service common to all state health agencies. In view of the widespread need for this service and owing to the fact that all public health authorities agree that health education is essential in health promotion, it can be safely predicted that health education activities will continue to be a basic function of health departments.

Policies differ greatly in the various states with respect to the provision of dental treatment. Direct service for adults is made available by only fourteen state health departments and the District of Columbia (a total of fifteen)

*Dental Services in State Health Departments**

	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming
	x	x	x	x	x	x	x	x	x	x	o	1†	x	x	x	o	x	x	o	x	x	x	x	x	x	o	x	x	x	1†	x	x	x	1†	1†#
	x	x	x	x	x	o	x	x	o	x	#		x	x	x		o	x		x	x	x	x	o	x	#	o	x	x		x	x	o		
						LH			DC								MC							MC			DL						MC		
	x	x	x	x	x	x	x	x	o	v			x	x	x		x	x		x	x	x	x	x	x		x	x	x		x	x	x		
	x	x	x	x	x	x	x	x	x	x			x	x	x		x	x		x	x	x	x	x	x		x	x	x		x	x	x		
	x	x		x									x[1]										x		x			x				x			
	x	x	x	x	x		x		x	x			x	x	x		x	x			x		x	x	x		x	x	x		x	x			
	x	x	x		x		x		x	x			x	x	x						x		x	x	x			x				x			
		x	x		x								x		x		x	x									x	x	x		x				
	x		x	x	x					x				x	x		x				x		x	x					x						
	x	x	x	x	x		x		x	x			x	x	x		x	x		x	x	x	x		x		x	x	x		x				
													1-3																1-2						
		x[1]					x[5]		x[3]				x	x[5]							x[1]		x[4]		x[3]		x[5]	x							
		x	x				x			x			x											x					x						
	x	x		x	x	x	x		x	x			x	x	x							x		x	x		x	x	x			x			
	x			x			x			x			x											x											
													OR																						

in 1945 authorizes establishment of a separate dental division; [1], maternity cases; [2], indigents; [3], V.D. cases; [4], T.B. cases; [5], industrial workers; R, X-rays in special cases.

and is limited in most instances to selected maternity and indigent cases. Thirty-two, or 84 per cent, of the state health departments that promote a dental program provide dental treatment services for children.

There is a considerable difference of opinion as to a choice between centralized clinics, mobile clinics and private dental offices for treating children eligible for free or part-pay dental service. Selection was probably based on local resources and attitudes toward dentistry for children. Be that as it may, centralized dental clinics are maintained by twenty-two state health departments and mobile clinics by fifteen, and in seventeen states private dental offices are utilized. Some state health departments use all three locations, some use two and others only one.

Dental examination and inspection of children are carried out in thirty-one states as a regular activity of the health department, while a similar service for adults is performed in seventeen states. In the latter instance, the service is limited to maternity, indigent, tuberculosis and venereal disease cases, and to cases among industrial workers.

Dental diagnostic service by state health departments began with laboratory examinations of Vincent's smears. Dentists and physicians may obtain reports on Vincent's smears from twenty-seven state health departments. In recent years, *Lactobacillus acidophilus* counts and biopsy have been added by some state health departments. *Lactobacillus acidophilus* counts of saliva specimens to determine dental caries activity is a comparatively new health department service. The requests by the dental profession for this diagnostic aid have resulted in the adoption of this laboratory procedure by fourteen state health departments.

Biopsy is made available to the dental profession by seven state health agencies. This important method of diagnosing pathologic conditions has been used by the medical profession to a much greater extent than by the dental profession. Judging by the rapid growth of saliva testing stations, as a result of the profession's interest, a similar increase in health department facilities for performing biopsies will undoubtedly be forthcoming if the requirements of dental practice are made known to public health authorities.

Summary

A close study of available information substantiates a general belief that there will be an expansion of dental health programs in the immediate future. It is also becoming evident that the official state health agencies will play an increasingly important role in the administration of dental health service. The new and more comprehensive approach will probably consist of greater health education activities, investigations in public health methods, epidemiologic studies of dental diseases and experiments in dental caries prevention and in dental care for children.

In view of these possibilities, it seems desirable and timely to reexamine the philosophies of public health administration in general and the present status of dental units of state health departments in particular.

The historical development of official state health agencies and their duties was traced briefly from the organization of the first state board of health in 1869. It was pointed out that the methods in public health practice were altered through the years in accordance with newer knowledge regarding disease prevention and cure. The opinions of specialists in the field of public health are presented to elucidate the purposes behind current administrative practices.

The functions of state health departments were outlined with the view of tracing the transition from duties limited to sanitation to the present-day practice of providing direct service to individuals. The establishment of clinic services and the marked tendency to increase clinic facilities have resulted in a new and somewhat controversial concept of public health administration.

All official state health agencies were canvassed to obtain up-to-date information on dental units and facilities in state health departments. Data were presented on the following subjects: (1) legal requirements and present membership of state health departments' policy forming or advisory bodies; (2) the state health departments that are currently promoting a dental health program; (3) the state health departments that have established a separate dental division or bureau; (4) the state health departments employing a dentist as director of the dental unit, and (5) the state health departments that provide dental health educational activities, dental treatment for adults and children in centralized clinics, mobile clinics or private dental offices and dental diagnostic services.

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THE POSTWAR ERA IS HERE

The time is yet too short in which to evaluate all of the change and progress that will come out of this war. But it will be difficult, indeed, for the postwar era to live up to, without disappointment, the lush advertising and prediction that have been visited upon it. The space between promise and achievement is still difficult to bridge, and many pretentious schemes will soon boggle down in postwar reality. The comforting fact, however, is that the world is now at peace and that skills, technics and genius can once again be applied to projects of greater social usefulness.

In dentistry, some postwar influences can already be noticed. Twenty-two thousand dentists entered the armed forces and performed the greatest task of dental rehabilitation in history. This job will never be estimated in terms of military worth or human benefits, but will do much to remove the last morsel of doubt about the efficacy of dentistry as a health service. The fact that this job was done under avoidable handicaps of unfair and outmoded regulations in the services is a tribute to the men who performed it and a warning to those who must plan for the future. One of the first of the postwar tasks must be to correct, once and for all, the many inadequacies revealed in the administration of the Army and Navy Dental Corps during the war.

The twenty-two thousand dental officers have performed millions of dental operations that can not help but reflect themselves in improved dental health in the groups of military age. For many servicemen, these operations were the first ministrations they had received at the hands of skilled, modern dentists. The results of this work in terms of public health education are immeasurable. It means an increased consciousness of the value of sound dental care on the parts of millions of young men and women. In the postwar period, this can lead to nothing but an increased demand and desire for regular and competent dental attention.

The dental preparation and rehabilitation of millions of men was one of the most concentrated tasks ever confronting a health profession. New methods of administration, new technics, new devices and new materials had to be developed as the need arose and the record shows that it was met with resourcefulness and

ingenuity by dental officers everywhere. Some of these new technics and methods may not be desirable except under the stress of war, but all should be examined for their applicability to the problems of providing more dental care to more of the people. Valuable experience has been gained too in the handling of large numbers of patients and all available information should be released to show the success or failure of those projects.

The postwar period should also produce some interesting data on the quality of service rendered under military conditions. There can be but little question that a large majority of dentists, unhampered by production quotas and similar restrictions, turned in the same high quality of work that they did in private practice. Whether quality might be increased by the judicious alteration of regulations is something that remains to be seen.

In the postwar period, it is the task of all dentists and dental societies to recognize these contributions made by their colleagues in military service. This recognition should take the form of aiding them in reestablishing themselves quickly and successfully in civilian practice. Promises made in the early days of recruiting should be fulfilled as rapidly as possible. Patients should be referred back to the returning dentist. Shortages in space and equipment should be remedied through cooperative enterprise. Aid should be extended, when it is desired, for refresher and retraining courses.

Only in this way can a way be opened for those who made a brilliant postwar period possible, not for dentistry only, but for all of the world.

NEW REGULATIONS FOR THE ARMY DENTAL CORPS

New regulations governing the Army Dental Corps have just been released by the War Department.[1] They are not to be considered as adequate in meeting the real needs of the Dental Corps or in removing the discrimination and inequalities that have hampered the work of almost every dental officer during the war.

This news will come as a disappointment to those who had taken the confident position of the Director of the Dental Division, Maj. Gen. Robert H. Mills, that progress could be made more effectively through changes in regulations than through legislation. Almost since the start of the war, the promise of such changes had been held out because even high officials did not long remain unaware of the rampant dissatisfaction caused in and out of the dental corps by antiquated and unfair regulations. In February of this year, General Mills asked formally[2] that legislation be withheld as improved regulations would soon be forthcoming. Not until six months later did the new regulations appear and then the war was within a few days of its close.

It is a matter of chagrin that the changes were delayed until whatever advances they contained would not be helpful to the Dental Corps in its wartime tasks. It is still more a matter of chagrin to know that the changes are incomplete and ineffective.

Under the new regulations, many traditional perquisites are still retained by the Medical Corps at the expense of dental officers. Little new authority is granted to dental officers to manage their own affairs. The causes of frequent complaints

1. J.A.D.A. 32:1222, September 15, 1945.
2. J.A.D.A. 32:489, April 1, 1945.

by dental officers have been wrapped up with new words, but considerable care has been exercised not to remove them. The domination of the Dental Corps by the Medical Corps may have been gently disturbed but, by and large, it remains complete and unshaken. An analysis of the new regulations will be published in a later issue of THE JOURNAL.

It is interesting to note that General Mills has already deemed it expedient to explain and interpret the new code in an effort to multiply its alleged benefits. For example, he asks dental officers and others to believe that the words "through the surgeon" do "not affect the administrative authority of the dental surgeon."[3] This phrase, if it has no bearing on the authority of the dentist, should have been removed, since dental regulations have too long been cluttered with obscure, pointless and confusing "officialese." If it does have a bearing—and no one who can read will say it does not—the main objective of the new regulations has obviously been frustrated. Even this waving of the general's rhetorical baton will do little to convince dental officers that they have gained very much.

It is not going to be enough in this instance for the hierarchy of the Dental and Medical Corps to say that all criticism is based on a failure to understand "Army methods and procedures." That tattered excuse and the one that we are at war have been used to obscure the basic issues for too long a time. The war is over. "Army methods and procedures" can now be examined in the light of wartime experience, and there will be few to say that they are not in need of drastic revision, particularly in the Dental Corps.

There are many critics of the management of the Army Dental Corps who do not feel that complete separation from the Medical Corps is the most satisfactory answer. The new regulations seem to provide no other alternative, however, for they give definite evidence that there is little hope of improving the status of the Dental Corps through internal procedures. The entire matter should be brought immediately to the attention of Congress, and legislation should be vigorously prosecuted to a successful conclusion. The response given by members of Congress to legislation designed to correct similar inequalities in the Naval Dental Corps is encouraging. If legislation is supported with testimony by officers who have worked under these arbitrary regulations, Congress will certainly lend an attentive ear. The dental officers of this war, it is true, will reap little benefit from such action, but at least they will be assured that their successors will never have to suffer similar indignities while trying to aid a country at war.

DENTISTRY IN STATE HEALTH DEPARTMENTS

The advances made in public health dentistry in less than thirty years have been noteworthy.[1] The Council on Dental Health makes this point sharply in this issue[1] through a survey of the present status of dental service and dental personnel in state departments of health. Lesser governmental dental units were not considered in this study although they have an acknowledged place in the complete program.

Since the first dentist was employed by a state health department in 1918, thirty states have established separate dental divisions, while ten additional states have

3. J.A.D.A. 32:1224, September 15, 1945.

1. Gruebbel, A. O.: Dental Services and Dental Personnel in State Health Departments. P. 1281.

dental units not independently organized. At the present time, thirty-seven states and the District of Columbia promote dental health programs and six states do not. The programs in five other states are inactive because of wartime shortages of trained personnel. In twenty-one states, the statutes require the appointment of at least one dentist to the state board of health; while, in three additional states, a dentist is appointed to the board without statutory provisions.

The study of the Council aptly points out that this progress has been directly associated with changing concepts of public health administration and with a growing appreciation of the influence that dental health has on general health. This appreciation has been manifested in two-thirds of the states by the establishment of a dental division, but it has not yet reached the point where all of these states make sufficient funds available for an adequate program and adequate personnel.

The study of the Council on Dental Health provides state and local councils with an excellent opportunity to evaluate their own programs in terms of those in neighboring states. It points the duty of state and local dental societies to work with these official dental health agencies in developing a program that reflects the greatest benefits on the citizens of that state. It indicates a need for more dentists trained in public health methods and, in some states, it reveals a need for immediate legislation to bring units and programs to the general level. In more than one-half of the states, there is work for dental societies to do in seeking representation for the dental profession on the state board of health.

This growth of dental divisions in state health departments has been constant and sturdy through three decades. It should now be accelerated to meet the extraordinary demands that are based on the increasing appreciation of the value of dental health on the part of the public. Such acceleration is in no way inimical to the profession's objective of supplying sound dental care to all of those who need it. On the other hand, it can be a strong deterrent to the development of programs that are not specifically adapted to the needs of a state by professional personnel selected by the citizens of that state. The trend toward strengthened state health departments is an obvious one, and dental societies will do well to secure to their state dental divisions the authority, funds and personnel for an effective public health program.

RELEASE OF DENTAL OFFICERS FROM ARMED SERVICES

The problems of demobilization are almost as thorny and technical as those of mobilization, and the great sense of urgency that accompanies the beginning of war has rapidly diminished. These factors, however, should not be allowed to interfere with the release of dental officers as rapidly as is consistent with military security.

The plans announced to date for the release of military personnel have seemed unnecessarily rigid to many and they have been the target for considerable criticism in Congressional circles. Unfortunately, military necessities being what they are, even Congress has been unable to get a satisfactory statement governing the release of officers from the armed services. The American Dental Association and its official agencies have neither the power nor authority to dictate or alter the policies of the War and Navy Departments in this regard. The Association, however, has

consistently urged the release of dental officers on grounds of age, length of service and dependency at the earliest possible moment. Under such a system, the younger men, some of whom have been educated at government expense, can be used in an equitable system of replacements.

The need for dentists in civilian life is great and, in many communities, it is acute. Conversely, the need for dentists in military service has been lessened by the cessation of hostilities and by the completion of the tremendous tasks of rehabilitation for overseas combat. There can be no good reason for the continued retention of dental personnel over and above reasonable needs. The skills of these men are too valuable to be allowed to deteriorate under enforced idleness when the military need for such a condition no longer exists. The early return of all dental officers who are not needed for essential services in the military forces would be a distinct contribution to civilian health. In addition, many dental officers have thoroughly earned their right to such consideration by the sacrifices they have already made.

FURTHER TESTIMONY FROM HEARINGS ON DENTAL RESEARCH AND GRANTS-IN-AID-BILLS. II

DR. PARRAN (continuing): Thus, only some 5,650,000 of the annual crop of 22,500,000 carious teeth are filled; 16,850,000 remain untreated to do their part to complicate, aggravate and destroy the dental health of these future adult citizens.

Since the need for dental service arises so frequently and universally, it should be made readily accessible if the gap between the need for service and the service received is to be closed. I would propose attacking this problem by instituting dental care programs in the schools, and the local public health organizations. There is no question that it will be a formidable undertaking. However, the Public Health Service is attacking with success other formidable health problems. The administrative provisions of this legislation relating to grants-in-aid are similar to those of the present venereal disease control and tuberculosis control laws.

The number of dentists available are entirely inadequate to deal with the problem of dental health on a national basis. It will be necessary, therefore, to increase the number of dentists and also to make more extensive use of auxiliary dental personnel, including dental assistants, dental hygienists and dental technicians. In order to provide them in sufficient number, provision should be made for their training. In addition, in the dental colleges, prospective dentists should be instructed in the help that they should expect to receive from auxiliary personnel. In that way, measures for effective cooperation looking to the public welfare can be made operative. A suitable training program would in itself be a considerable undertaking, and one that we should expect to expand gradually, as experience, facilities and provisions accumulate.

An effective program of treatment will need the hand-in-hand assistance of intelligent, well-planned, widely distributed health education. There has never before been a time when the general public has taken such an interest in, or been so concerned with, matters of health. Not only does this present attitude afford an opportunity for the dissemination of those ideas which should be common property, but, in reality, there is an active obligation to impart this information.

Having set forth in broad outlines the dental health problem of this country and having presented certain general approaches to the solution of that problem, I would like to comment on the proposed legislation which is being discussed here. The administrative features of S. 190, a bill to provide for research relative to dental diseases and conditions, are very similar to those contained in the Reorganization Act of 1944, Public Law 410. More specifically, they are almost identical with those of the National Cancer Institute Act which became law in 1937. Our experience in the successful administration of research programs through our National Institute of Health leads to a general endorsement of the administrative provisions of S. 190.

Likewise S. 1099 follows a familiar pattern of authorizing federal assistance to the states in promoting the dental health, in continuing studies and demonstrations, and in training personnel necessary to carry out the program.

Both of these bills seem basically well conceived. The committee may wish to consider combining the provisions of the two bills and establishing one dental advisory council which would serve the functions given to two councils by the terms of the two bills. If, however, the committee decides to report the bills separately, there would be no overlapping in the administration of the two measures, since S. 190 deals solely with research problems and S. 1099 is concerned primarily with grants-in-aid and the other features which I have described.

There are a few amendments of a technical nature which I should like, with your permission, to submit later.

However, the data show that as the per capita income class of the county increases, the average number of persons per dentist decreases. In counties where the average per capita income is less than $100, there are over 11,000 persons for each dentist. On the other hand, in counties where the average per capita income is $600 or more, there are only 1,300 persons per dentist.

In the most wealthy counties are to be found also one-half of the population and 69 per cent of the dentists.

Testimony of Dr. Sterling V. Mead, President Elect, American Dental Association

SENATOR AIKEN: Dr. Mead, will you identify yourself for the record?

DR. MEAD: Senator Aiken and members of the committee, General Parran: I am Sterling V. Mead, President Elect of the American Dental Association, and in the absence of Dr. Walter H. Scherer, of Houston, Texas, who is President of the American Dental Association, and Dr. Carl O. Flagstad, the chairman of the legislative committee, I would like to act as chairman of the group selected

from the American Dental Association to give testimony in connection with these bills.

It is my purpose to present to you from this group a concise survey especially of the research bill this morning. This program is interrelated, definitely interrelated, and we will discuss, if it is agreeable to you in your plans, the other phase of this program tomorrow, and we would like to center at this time especially on the research program.

I appreciate this opportunity to testify on this bill, which can be of such a tremendous and beneficial influence on the health of the American people. I speak for the American Dental Association, which represents 58,000 of the 70,000 dentists in the country. The American Dental Association I believe, crystallizes the opinion of dental societies in every state and in hundreds of districts and communities throughout the country.

I am sure that all of you are familiar with the fact that there are more diseases connected with the mouth than any other part of the body. There is no question of the great importance of research. It is like the story that you may stop a dog from howling by cutting off his tail right up back of his ears, but it is better to find out what makes him howl.

We are very much interested in this research bill as an interrelated part of the program because we find that it is impossible to get intelligent and comprehensive research with our present facilities. The American Dental Association has long advocated a more intensive program and has sought funds from various sources to augment dental research.

As illustrating the necessity for a program on dental caries, for instance, the research commission of the American Dental Association in 1939 made a survey of findings on dental caries, with 195 summaries by observers and investigators in twenty-five countries, and each of these had a different opinion as to the etiology of caries. I would like to present this book to the committee for its consideration in this project.

(The book, Dental Caries, was marked "Exhibit 1" and is on file with the committee.)

DR. MEAD (continuing): There must be in research a long-range program which cannot be accomplished with our present facilities. It means going to every country of the world and studying what is taking place with the teeth of the people, the incidence of periodontal disease and so forth. It means compilation of all of the literature on this subject. It means having a centralized area where the work can be carried out with plans for research extending into the states and different localities. And then it means finding the opportunity to correlate all this vast amount of material in order to get down to the problem of the real cause of these diseases.

Dental diseases are universal in that they attack almost every man, woman, or child at some time during life. There is practically no other disease that attacks such a large part of our population so consistently.

American dentistry has established a leadership in dental science that is recognized throughout the world. Yet the dental health

*Table 2.—Distribution of Dentists According to the per Capita Income Classification of Counties in 1940**

Per Capita Income Class of Counties in 1940	Population 1940	Dentists	
		All	Persons per Dentist
All counties	115,441,765	65,043	1,775
Under $100	1,260,568	109	11,565
100-149	3,834,392	445	8,617
150-199	5,724,854	939	6,097
200-249	5,688,710	1,242	4,580
250-299	5,017,467	1,439	3,487
300-349	4,553,763	1,567	2,906
350-399	4,862,290	1,826	2,663
400-449	5,026,898	2,121	2,370
450-499	6,820,166	3,065	2,225
500-599	14,614,670	7,492	1,951
600 and over	58,037,987	44,798	1,296

*Based upon county totals presented by the American Dental Association in their publication "Distribution of Dentists in the United States," Committee on Economics, 1942. State totals for dentists as reported by the Association are generally higher state for state than are those reported for 1940 by the U. S. Bureau of the Census. The material presented by the committee does not include counts for Illinois, Minnesota, South Carolina, Washington and West Virginia. The difference between the ratio of population to dentists for the country as a whole as represented by this table based on data from the American Dental Association and that presented in Table 5 based on figures from the U. S. Bureau of the Census is largely accounted for by the fact that the totals presented by the American Dental Association generally were higher state for state than those of the Bureau of the Census. Ratios presented in this table, therefore, are lower than they would be if county data had been available from the U. S. Bureau of the Census for 1940. However, the data show that, as the per capita income class of the county increases, the average number of persons per dentist decreases. In counties where the average per capita income is less than $100, there are more than 11,000 persons for each dentist. On the other hand, in counties where the average per capita income is $600 or more, there are only 1,300 persons per dentist. In the most wealthy counties are to be found also one-half of the population and 69 per cent of the dentists.

*Table 3.—States Arrayed According to Ratio of Population to Dentists in 1940**

States	Average Number of Persons per Dentist, 1940	States	Average Number of Persons per Dentist, 1940
United States	1,878		
1. South Carolina	5,263	25. Nevada	2,042
2. Mississippi	5,250	26. Wyoming	2,022
3. Arkansas	5,077	27. Montana	2,020
4. Alabama	4,683	28. Michigan	1,986
5. New Mexico	4,665	29. Indiana	1,896
6. North Carolina	4,544	30. Rhode Island	1,892
7. Georgia	3,796	31. Ohio	1,837
8. Kentucky	3,579	32. Utah	1,798
9. Tennessee	3,459	33. Kansas	1,776
10. Arizona	3,263	34. Colorado	1,692
11. West Virginia	3,186	35. Pennsylvania	1,675
12. Texas	3,184	36. Missouri	1,655
13. Virginia	3,173	37. Connecticut	1,577
14. Oklahoma	3,145	38. Iowa	1,567
15. Louisiana	3,004	39. New Jersey	1,555
16. Florida	2,657	40. Massachusetts	1,537
17. Delaware	2,538	41. Wisconsin	1,489
18. North Dakota	2,450	42. Nebraska	1,433
19. Idaho	2,441	43. Washington	1,383
20. Vermont	2,363	44. Minnesota	1,348
21. Maine	2,247	45. District of Columbia	1,345
22. New Hampshire	2,194	46. Illinois	1,330
23. South Dakota	2,136	47. New York	1,321
24. Maryland	2,093	48. Oregon	1,313
		49. California	1,279

*U. S. Census: 1940; Population, Vol. I. First Series number of inhabitants and Vol. III. The Labor Force, Part 1, United States Summary, Table 65.

Among the several states in 1940, ratios of population to dentists ranged from 5,263 in South Carolina to 1,279 in California, with a national average of 1,878 persons per dentist. In that year twenty-seven states had more than 2,000 persons per dentist, while in fifteen the number exceeded 3,000. Of the fifteen states with more than 3,000 persons per dentist, twelve are southern states.

of the American people is far from satisfactory. There are many reasons for this situation: the vast problems, the lack of personnel and the lack of public resources. For example, only a pittance has been spent for dental research by public and private agencies as compared with vast sums spent for less universal and less destructive diseases. This lack of financial support has also materially retarded the development of widespread programs of dental health education and dental care, which can contribute effectively to the prevention and control of certain diseases.

The American Dental Association, as well as sympathetic supporters from the fields of the health and social sciences, have long recognized this problem. The American Dental Association for many years has been committed to a three-point program. I would like to present to the committee the program that has been established by the American Dental Association, and one of the parts of this program is dental research.

DR. MEAD (continuing): The summary of the principles of that program are:

1. Intensified dental research to secure more information regarding the causes of dental diseases, thus making preventive measures more effective and eventually decreasing the amount of dental disease.

2. A national program of dental health education to motivate people to utilize the most effective methods of prevention and control of dental disease.

3. Programs for dental service, particularly for children, since the most effective prevention and control can be accomplished in this age group.

Such a program, properly supported by the community, state, and nation, will constitute an effective attack on dental disease. The research bill which is now before this com-

*Table 4.—Distribution of Dentists According to the Size of the Largest Urban Place in Counties in 1940**

Largest Urban Place in Counties 1940	Population 1940	Dentists: All	Dentists: Average Number of Persons per Dentist
All counties	115,441,765	65,043	1,775
Under 2,500	12,651,275	2,991	4,230
2,500- 4,999	11,006,273	3,433	3,206
5,000- 9,999	12,942,513	4,819	2,686
10,000- 14,999	7,184,748	2,958	2,429
15,000- 24,999	8,921,015	4,300	2,075
25,000- 39,999	6,757,525	3,575	1,890
40,000- 49,999	2,625,669	1,476	1,779
50,000- 99,999	9,072,429	5,126	1,770
100,000-249,999	12,469,507	7,848	1,589
250,000-499,999	9,318,912	7,256	1,284
500,000 and over	22,491,899	21,261	1,058

*Based upon county totals presented by the American Dental Association in their publication "Distribution of Dentists in the United States," Committee on Economics, 1942. State totals for dentists as reported by the Association are generally higher state for state than are those reported for 1940 by the U. S. Bureau of the Census. The material presented by the committee does not include counts for Illinois, Minnesota, South Carolina, Washington and West Virginia.

*Table 5.—Percentage of White Persons (3 Years and Older) Reported to Have Received Dental Care (Exclusive of Extractions Only) During the Study Year by Socio-Economic Class of Household Head**

Socio-Economic Class of Household Head	Per Cent	Persons Receiving Care	Population Surveyed
Professional persons	42.5	1,158	2,726
Dealers, etc.	30.0	2,123	7,069
Clerks, etc.	30.6	2,682	8,757
Skilled workmen and foremen	20.8	3,676	17,698
Semiskilled workers	17.2	3,313	19,245
Unskilled workers	16.3	1,416	8,690
Servants	18.3	313	1,714

*Britten, R. H.: Study of Dental Care in Detroit Michigan. Pub. Health Rep., 53:446-458, March 25, 1938.

mittee incorporates the best professional knowledge and advice that could be brought to aid in the solution of this highly technical and complicated problem. I believe, and the members of the American Dental Association believe, that the passage of S. 190 will be of enormous value in bringing dental health to more of the American people.

I urge your sympathetic consideration of this great health program. I ask you to evaluate its urgency. The passage of this bill will bring the benefits of dental health to every home. I ask your support for this bill so that weapons can be provided at once and in full amount for this war against dental disease.

SENATOR TUNNELL: What do you include in dental health?

DR. MEAD: Dental health means the care of the teeth locally and the care of the surrounding tissues of the mouth, and the attendant effect upon the body as a whole. The mouth reflects very definitely disease in other parts of the body. Many diseases—a great many diseases—can be caused by disturbances in the mouth, from the teeth and surrounding structures; and also we find that many general diseases are reflected by lesions that become apparent in the mouth. Sometimes the first recognition of a general disease is that seen in the manifestations of this disease in the mouth.

SENATOR TUNNELL: I was wondering if you included anything more than the teeth themselves.

DR. MEAD: Oh, yes; the teeth and surrounding structures.

I would like to insert in the record the following statement:

Dental Health for the American People—A Statement of Principles by the American Dental Association

1. Research: Adequate provisions should be made for research which may lead to the prevention or control of dental diseases.

2. Dental health education: Dental health education should be included in all basic educational and treatment programs for children and adults.

3. Dental care: (*a*) Dental care should be available to all regardless of income or geographic location.

(*b*) Programs developed for dental care should be based on the prevention and control of dental diseases. All available resources should first be used to provide adequate dental treatment for children and to eliminate pain and infection for adults.

(*c*) Dental health is the responsibility of the individual, the family and the community in that order. When this responsibility, however, is not assumed by the community, it should be assumed by the state and then by the Federal Government. The community in all cases shall determine the methods for providing service in its area.

4. In all conferences that may lead to the formation of a plan for dental research, dental-health education, and dental care, there should be participation by authorized repre-

sentatives of the American Dental Association.

In connection with our program, we have brought to this committee the following men: Mr. Bagdonas, Dr. Camalier, Dr. Conrad, Dr. Easlick, Dr. Fitzgerald, Mr. Fox, Dr. Gruebbel, Dr. Hillenbrand, Dr. Jay, Dr. Martin and Dr. Morrey, and I am going to call upon five of these gentlemen to present in a concise way our conception of the need for this research. The first gentleman I would like to call upon is Dr. Harold Hillenbrand, of Chicago, the Editor of the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION, and his subject will be the background of the bill.

TESTIMONY OF DR. HAROLD HILLENBRAND, EDITOR, JOURNAL OF THE AMERICAN DENTAL ASSOCIATION, CHICAGO, ILL.

DR. HILLENBRAND: I have a very brief statement which I wish to submit on the background of the research bill. My name is Harold Hillenbrand. I am from Chicago and am Editor of the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

SENATOR TUNNELL: Are you a dentist?

DR. HILLENBRAND: Yes, I am.

The American Dental Association has long evidenced a continuing interest in all phases of dental research. Ever since its establishment, the Association has had an active part in promoting dental research through its own facilities and those of its constituent societies. In the last two decades, the American Dental Association has been able to advance substantial sums out of the funds derived from its members for the intensification of dental research. This has been done through the maintenance of fellowships at the Bureau of Standards, at the National Institute of Health and at the Army Medical Museum, maintenance of a Research Commission and in many other ways. Such efforts have been a part of the program to achieve the objectives for which this professional association was organized.

In 1938, the attention of the nation was turned to the development of a national health program. At that time, the American Dental Association officially announced itself as favoring a three-point plan for the sound development of a national health (dental) program. The first point is the intensification of dental research; the other two are increased dental education and dental care. This program, obviously, is a long-range one directed at the ultimate prevention and control of a vast amount of dental disease.

In 1940, at the request of the American Dental Association and through the good offices of Senator Murray, a bill to provide federal funds for intensified dental research was introduced. In reporting this bill favorably, the Committee on Education and Labor stated significantly:

> The committee is cognizant that in the past very small amounts of funds have been expended for the investigation of these serious and highly prevalent diseases. It is only fitting that the Federal Government should take the initiative in this work and utilize the splendid facilities and trained investigators of the Public Health Service already operating in the National Institute of Health. They are also in a position to stimulate with small grants-in-aid those public and private institutions which are making worth-while scientific investigations in this field. These (dental) diseases are so universal among our citizens that it seems only fit that the Federal Government should take the leadership.
>
> The committee has given much consideration to the question as to the amounts of the authorizations of appropriations and as to the question of a single or continuing appropriation. The committee believes that there is no room for reasonable doubt that any attack on the dental disease problem must be a long-range program and that such a long-range program is the very heart of the structure upon which our future methods of the control of these diseases must rest. . . .

In the intervening four years, with the coming of the war, the problem has not diminished. Every fact revealed by the widespread physical examination of the nation's youth for military service indicated that the effective prevention and control of dental disease on a wide scale was still a matter for further investigation and study. The necessities of the war have decreased the number of men who were able to continue at work on their problems, and in some areas of dentistry there has been a noticeable lack of research projects and personnel.

The passage of this bill at this time will do much to stimulate and support research work already under way; it will be valuable in the training of competent research workers; it will make it possible for the fields of examination to be increased and multiplied; it will lay the cornerstone of the program that can control dental disease in this country. Such a program is needed urgently now and this research bill will do much to put it into effective action.

SENATOR TUNNELL: Suppose a person's blood stream is poisoned from difficulty in the mouth; is that a dental disease?

DR. HILLENBRAND: I think there would be very direct dental implications; yes.

SENATOR TUNNELL: I was wondering how far you went with the expression "dental disease."

DR. HILLENBRAND: To amplify Dr. Mead's statement, I think we used the term "dental health" merely to form a contrast with general health, which does, of course, include dental health.

SENATOR AIKEN: Your next witness, Dr. Mead?

DR. MEAD: Our next speaker is Dr. Philip Jay, associate professor of dentistry and director of dental caries research, School of Dentistry, University of Michigan; his subject, "The Need for Expanded Dental Research."

TESTIMONY OF DR. PHILIP JAY, ASSOCIATE PROFESSOR OF DENTISTRY AND DIRECTOR OF DENTAL CARIES RESEARCH, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.

DR. JAY: Mr. Chairman, the need for expansion of dental research, it seems to me at this time, is extremely urgent. Dental disease in one form or another, as has been indicated, affects practically our entire population.

Ninety-five per cent of the children in our public schools have active dental decay, and those who are fortunate enough to be classified among the 5 per cent who may be immune to this disease are apt to become victims of pyorrhea, so that in one way or another dental disease is found to affect every one.

The state of dental health as revealed by examinations in induction centers at the beginning of the war, as previously indicated, was not encouraging. Out of the first million men rejected for physical reasons, 20 per cent were not eligible for military service because of dental defects. In addition to this vast amount of dental disease, there is an acute shortage of dental manpower, as was also indicated before.

These twin problems of a vast amount of dental disease and an insufficient amount of personnel indicate the urgent need for some method of decreasing the amount of dental disease, to say nothing of decreasing the present high national cost of these diseases. Intensified and expanded research, through which more facts can be learned about dental disease, provides one great approach to this problem.

Some progress has already been made. It is possible, for instance, to prevent dental decay in a large majority of susceptible individuals, but the methods known today are not applicable on a wide scale. On the other hand, the very fact that it is impossible to check this disease is evidence that considerable data have already been obtained concerning its etiology, despite the fact that dental research has been conducted by only a few properly trained workers and usually under most unfavorable conditions. It has been most difficult to obtain qualified personnel for dental research in the past, owing largely to lack of funds. Grants-in-aid to universities were necessarily short-term in character. It is not easy for an investigator with no other means of support to accept a six months or one-year appointment. What is more important, perhaps, is the fact that, with restrictions in time and equipment, research cannot be conducted in an orderly manner.

A considerable portion of the financial support thus far obtained has come from commercial sources, having in view the promotion of sales of their own products. We are familiar with the type of advertising that has accrued from this sort of research. Some of the foundations have made it possible, through fellowships, to train dental personnel for dental research, but owing to lack of adequate support some of those individuals are obliged to go into research for commercial interests, or to engage in clinical practice. Federal support of dental research in dental schools connected with universities would make it possible to place already trained personnel and would also serve to inspire others to become interested in this important work.

It seems to me that a precedent has already been established which ensures the success of federally endowed projects. The advancement in medical research made by the National Institute of Health has gained national and international recognition and approval. The dental research conducted by the National Institute of Health is of the highest character. Some of the studies conducted in the dental department of the United States Public Health Service promise to have a very wide application on a public health level. The expansion of the dental program of the National Institute of Health by the enlargement of its physical plant and increase in its personnel is certainly warranted and indicated at this time.

Dental education has made very rapid advancement in America during the past generation, so that now there are many dental schools in our universities which enjoy a close association with various allied fields of science. With adequate financial support, studies could be conducted in these institutions on the highest possible level. Adequate financial support would make it possible for studies to be conducted by scientists whose major interests are concerned with dental problems. Dental research problems are complex. They require the attention of investigators who are perfectly at home in the rapidly expanding fields of chemistry, physics, bacteriology and the biologic sciences in general. This is not an overambitious program, for a start has already been made, and the solution of some very perplexing problems seems almost within our grasp. It seems to me that bill S. 190 is well designed to provide the impetus so urgently needed at this time.

SENATOR SMITH: I was wondering whether you had in mind developing the program under S. 190 to give subsidies, perhaps, to universities or institutions where medical instruction is being carried on; or would you have separate laboratories? What was the general thought?

DR. JAY: As I understand it, the bill provides for an expansion of the National Institute of Health to include a new building for dental research.

SENATOR SMITH: To what extent has the Rockefeller Foundation helped dental research?

DR. JAY: The Rockefeller Foundation has made fellowships available to dentists at the University of Rochester and the Yale Medical School, making it possible to train dental personnel for the teaching of research. Although the Foundation has discontinued its support of these projects, Carnegie fellowships are now available at the University of Rochester.

SENATOR AIKEN: I would like to ask Dr. Jay, so long as the need for more dentists is apparent, why do not more young men and women take up dentistry as a profession? Is it lack of schools? Is it the cost of obtaining the education? Is it fear that they wouldn't make a living after they got their education? Or is it that other occupations appear more attractive to them?

DR. JAY: I might venture an opinion on that subject, but I would prefer to have you direct that question to Dr. Kenneth Easlick.

who has made a study of the problem.

SENATOR AIKEN: We can ask him tomorrow and save the time today.

I wish that when you come back tomorrow, Dr. Mead, you would have some suggestion to make as to the advisability of combining the two bills, or state whether you feel they should be put through and acted upon separately.

Have you any questions, Senator Tunnell?

SENATOR TUNNELL: I thought I would like to ask him this and maybe he would venture a guess—and maybe it isn't a guess. Is the shortage of dentists caused by the war?

DR. JAY: Of course, the present shortage of dentists in the civilian population is caused by the war, since a third of them are in the Army. But there was a shortage before the war.

SENATOR TUNNELL: That is what I was getting at.

SENATOR AIKEN: And it will be shorter after the war.

DR. JAY: Yes; I think the enrollment in dental schools has decreased steadily.

SENATOR AIKEN: Isn't it a fact that three or four million men in the armed services who hadn't had their teeth cared for before they went into the Army or Navy will realize the need to have them cared for after they come out, so that the shortage of dentists will be more acute than ever?

DR. JAY: Yes; I think there will be a greater demand.

SENATOR AIKEN: They will not only want their own teeth cared for; they will want their families' teeth cared for.

DR. JAY: I think there will be much greater need for dentists.

SENATOR TUNNELL: While the war has increased the problem among civilians, there will still be such a problem after the war, in your opinion?

DR. JAY: Yes; there are some interesting statistics on that which you will probably hear during the hearing. There certainly aren't enough dentists.

SENATOR TUNNELL: Suppose you had this law; would you have plenty of dentists then, do you think?

DR. JAY: I don't know but I think it would help. I think perhaps it would make dentistry much more desirable. It certainly would for people who are research-minded.

SENATOR TUNNELL: What I was getting at was, the research people would find out the difficulty, perhaps the remedy, but wouldn't you still be short of dentists?

DR. JAY: Yes, I suppose we would for a while. I think that is going to take a long time, but I am still hoping that we can reduce the prevalence rate of dental disease.

SENATOR TUNNELL: I am not speaking against that. I am just trying to get at your problem.

DR. MEAD: I might state in this connection, as I stated before, that this problem is very interrelated and as we go on with our program today and tomorrow, I think many of these questions will be answered by the witnesses that we present in their prepared statements. Of course, the great purpose of research is to find out the cause, and when you find out the cause you take care of much of the need for more dentists because it is much better to know what you are doing and what you are treating than to treat the end results. That takes care of a great number. But we will try to answer those questions to your satisfaction as we progress with this.

The next speaker is Dr. C. Willard Camalier, who is chairman of the war service committee of the American Dental Association, and his subject will be "Findings of the War Service and Postwar Planning Committee."

TESTIMONY OF DR. C. WILLARD CAMALIER, CHAIRMAN, WAR SERVICE COMMITTEE OF THE AMERICAN DENTAL ASSOCIATION, WASHINGTON, D. C.

DR. CAMALIER: Senator Aiken and members of the committee: The war service and postwar planning committee of the American Dental Association during September and October 1944, with the cooperation of the chiefs of the respective military dental services, distributed about 21,000 questionnaires among the commissioned dental officers in the continental United States and overseas. By January 1, 1945, 7,549 replies had been received containing sufficient information for purposes of statistical tabulation and analysis. While the question of research was not given specific consideration in the questions propounded to dental officers, it is fair to draw some conclusions from an indirect approach to the subject which will show this committee the interest of the returning veteran in legislation of this type.

For instance, while only about 8 per cent of the dental officers expressed a desire to teach in dental schools upon their return, 70 per cent have expressed a wish to secure some type of refresher or postgraduate work under the auspices of dental schools or dental societies. With allowance made for a change in attitude upon return, the number anticipating further training may reach the staggering total of 10,000 dentists. The principal refresher courses requested include training in oral surgery, prosthetic dentistry, crown-bridge, anesthesia, orthodontia, periodontia, operative dentistry, x-rays and children's dentistry.

(Continued in next issue)

REPORTS OF COUNCILS AND COMMITTEES

THEORY AND FACT IN DENTAL LEGISLATION

Ten years ago, when the mail order denture racket appeared, dentists all over the country were aroused and loudly proclaimed, "What's the matter with the American Dental Association? Why doesn't the legislative committee stop it?" As the years have gone by and this unscrupulous business continues, our members have been puzzled: they cannot understand why legislation moves so slowly.

More recently, since large numbers of our members have entered the armed forces and learned that certain military barriers in the medical department impede their progress and also hamper the Dental Corps, loud cries have again arisen, "Why doesn't the American Dental Association and the legislative committee get on the job and change things?" Editors, eager to champion the cause of dentistry, have written reams of editorials, some of them very commandable discussions, other woeful predictions that a crisis has arisen in the life of the Association and unless the issue is satisfactorily solved the American Dental Association will fall by the wayside.

Some time ago, a president of a large district society sought advice from the Committee on Legislation as to how he might handle an embarrassing situation which had arisen in his society concerning procedure against the Wagner Bill. He said that there was a faction in his society composed of members who wanted positive, forceful opposition to the bill and were harshly criticizing the American Dental Association for what they termed a lamentably weak stand. While the committee was discussing the matter, the leader of the belligerent faction joined the group and proceeded to condemn the American Dental Association and the committee in vehement language for their inactivity. When someone endeavored to remonstrate, the speaker's language became stronger and he ended with this statement, evidence of his ignorance of legislative procedure: "The legislative committee can't be any good or why would it permit Wagner and his political cohorts to introduce such a bill?"

I cite these incidents to illustrate that dental legislation in theory is one thing, but in practice quite another. It is easy to theorize as to what ought to be done, but to create legislation which will pass Congress and which can be enforced after it is a law is frequently a tremendously difficult task. A proposed bill, from its inception to its final passage by Congress, travels a long and wearisome road, and when it finally becomes a law, one must begin all over again, on an even more arduous journey, to secure its enforcement. As one considers the way of legislation and the operation of dental laws, he becomes more amazed every day at the multitudinous ways in which the intent of certain legislation can be circumscribed. Every time one thinks that he has closed a loop hole of escape, the offender finds another in which to take refuge.

It has been my privilege to serve on the legislative committee for the past twelve years and I assure you that the American Dental Association, through its loyal support of the committee, has been constantly on the job protecting the interests of the public and the pro-

fession in matters pertaining to dentistry. It is true that progress has frequently been extremely slow, and sometimes the approach of the legislative committee has not been understood. The committee appreciates this opportunity to list some of the accomplishments and problems of federal dental legislation and to inform you concerning bills now before Congress.

Perhaps I can best discuss legislative matters under the following headings:

1. Legislation for the Dental Corps of the Armed Services.

2. The activity of the committee in endeavoring to create legislation as requested by the House of Delegates, to carry out the provisions of the American Dental Association "A Dental Health Program for the United States."

3. The enforcement of the Traynor Law and some decisions of the courts.

4. The Chicago office of the committee and how it functions.

5. Some trends in compulsory health insurance.

6. Other state and federal legislation of interest.

Legislation for the Armed Forces

The legislative committee's record of the past ten years in relation to securing improvement of the status of the dental corps in the armed forces is remarkable. The committee, during peacetime and wartime, has consistently endeavored to secure greater recognition for the Dental Corps. About eight years ago, when the committee urged the adoption of a resolution by the House of Delegates favoring parity of administration with the Medical Corps, it was impossible to arouse the slightest interest. Since the coming on of the war, and since large numbers of the profession have been called into the service, the situation regarding the relation of the Dental Corps to the Medical Corps has been sharply challenged. Champions of the dentists in the service have arisen in almost every state to plead their cause and condemn the slowness of action of the American Dental Association.

A look at the record of the accomplishments of the American Dental Association, chiefly through its legislative committee, is enlightening.

1. In 1933, the committee, above the opposition of the Medical Department administratives, forced in the proposed Military Bill acceptance of a raise in rank of the chief of the Dental Corps from colonel to brigadier general. Since authority flows from rank, this was a distinct achievement. It also secured a change from one dentist per thousand enlisted men to one and one-half per thousand.

2. In World War I, there were more than 2,000 dentists serving as privates throughout the war. In this war, there are few dentists who are serving as privates. The American Dental Association, through its war service and legislative committees, was instrumental in bringing this about as, from the outset of the war, the Association has fought to conserve dentists for professional service. At the beginning of the war, approximately 200 dentists were inducted as privates, but, through the efforts of the Association, they were soon given commissions.

3. The legislative committee had incorporated in the Public Health Bill, which has now become a law, the appointment of an assistant surgeon general with the grade of rear admiral to have charge of all dental matters in the Public Health Service. This is a distinct advance for the Dental Corps in the Public Health Service.

4. The rank of rear admiral in the Navy was recently granted through the efforts of the committee. This was also accomplished against the wishes of the Navy department.

5. As regards the Navy Dental

Bills, in December 1944, a drive was staged by the legislative committee to secure passage of the Navy Dental Bill before adjournment of Congress. On December 12, the House of Representatives passed the bill with a large majority. At the same time, hearings were being held by the Senate Naval Affairs Committee at which the legislative committee, with the assistance of others, forcefully presented the case for the American Dental Association. The chief opposition to the bill came from the Navy department and the Surgeon General of the Navy. The House hearings on this bill have been published in THE JOURNAL.

The legislative committee was hopeful, even to the closing days of Congress, that the bill would come out of the Naval Affairs Committee with their favorable endorsement and reach the Senate in time for a vote; but a minority group managed to stall a vote in the committee and the bill died with the adjournment of the 78th Congress.

Shortly after the convening of the 79th Congress, the legislative committee secured the introduction of a new Navy Dental Bill which was designated as H.R. 2584 and S. 715. Since our difficulty in the former endeavors occurred in the Senate Naval Affairs Committee, we decided to begin operations there with a new hearing before that committee.

We are pleased to report that the hearing was successful for June 18 the bill was reported favorably and a few days later it passed the Senate. It is our opinion that since it received the endorsement of the House in the last session of the 78th Congress, it will readily pass the present House and subsequently be signed by the President. We believe that this legislation will soon be enacted.

Army Dental Bill

The October House of Delegates directed the legislative committee to introduce into Congress a bill for the Army Dental Corps similar to the Navy Dental Bill then pending in Congress. The committee has not lost sight of these instructions, but is awaiting certain developments before embarking on this legislative venture. The chief of the Army Dental Corps has assured the committee that the desired results can be obtained by changes in regulations. At a recent conference, he indicated that progress is being made in this direction.

In conclusion, on this particular subject, I desire to state that every major improvement in the Dental Corps in relation to the armed services has been brought about by the American Dental Association, and frequently over the opposition of the administration of the departments and of necessity without aid from members of the Dental Corps.

The legislative committee is pleased to report some constructive conferences with the United States Public Health Service and the Veterans Bureau regarding certain inadequacies existing in these bureaus in relation to the status of the dentist. It is our hope that these bureaus will endeavor to correct, by administrative action, discrepancies existing in the rank and salaries of dentists employed in these services.

The scope of dental service to be rendered by the Veterans Bureau after the war will be greatly increased and the nature of this development should be of considerable concern to the dental profession. The method of distribution of health service by the Veterans Bureau has been challenged in some quarters and a change of policy is recommended.

At present, the Veterans Bureau secures its professional personnel through civil service. Several bills have been introduced into Congress to change this procedure by providing for the establishment of a bureau of medicine and surgery in the Veterans Administration. The Rankin Bill (H. R. 3310), which

has the Bureau's endorsement, seems to have the inside track and will undoubtedly go into hearings very soon. Since this bill sets up the same relationship of dentistry to medicine as now exists in the armed forces, which we are endeavoring to correct, our committee opposes the bill in its present form.

The Right to Command Bill S 916

Bill S. 916, which recently passed the Congress, removes the limitation on the right to command of officers of the Dental Corps of the Army. Under the former law, officers of the Dental Corps had no right to command except within that corps.

"No such limitations were placed upon officers of the Medical Corps, the Veterinary Corps, the Pharmacy Corps, the Medical Administrative Corps, or the Sanitary Corps; all such officers being entitled to command within the Medical Department generally.

"The enactment of this bill places officers of the Dental Corps on the same command status as officers of the other corps and will permit more flexible and efficient operation of the Medical Department."

"A Dental Health Program for the United States"

The three-point legislative program of the American Dental Association providing for research, dental health education and dental care, especially for children; has been fully explained in a pamphlet entitled, "A Dental Health Program for the United States." It is based on the principles that were adopted by the House of Delegates in 1938 and as revised in 1944. This pamphlet was prepared by a joint committee; has been printed and is available for general distribution. It was published in THE JOURNAL, Vol. 32, No. 7, April 1, 1945, on pages 498 to 501. It has for its objective the wider distribution of dental health service and the more efficient control of dental disease. The legislative committee has been given the task of initiating federal legislation which, if passed, will make it possible to launch this program.

The first step as set forth in the program is the securing of federal funds for intensified dental research. The legislative committee succeeded in interesting Sen. James Murray of Montana in fostering such legislation. The Dental Research Bill (S. 190) was introduced into the 79th Congress by Senator Murray. This is the most comprehensive request for research funds that dentistry has ever made. In short, it provides one million dollars for the creation of the national institute of dental research, presumably to be built at Bethesda, Md. It also provides for an annual appropriation from federal funds of $730,000 for the maintenance of research at the National Institute and for grants-in-aid to other worthy research projects carried on outside the institute by other agencies. In my opinion, this bill will receive favorable consideration and has a good chance of passage.

The second and third steps in the "Dental Health Program" is an enlarged "national program of dental health education" and "programs for dental service, particularly for children" and then for the adult indigent. These programs would be administered on state and community levels subsidized by federal funds if necessary.

In order to carry out this part of the proposed dental health program, our committee has initiated legislation for securing earmarked funds for dentistry which can be distributed as grants-in-aid to states. The bill has been drawn and was introduced by Congressmen Traynor of Delaware and Brehm of Ohio, both dentists, in the House, where it is known as H. R. 3412-3414 and by Senators Pepper of Florida and Aiken of Vermont in

the Senate, where it is known as S. 1099. The bill provides for the allocation of grants-in-aid of a substantial financial sum annually to states from certain federal funds.

The Research Bill (S. 190) and the Dental Health Education and Care Bill (S. 1099) were in hearings before a senate committee on June 26, 27 and 28. The legislative committee considered this one of the "big moments" in dental legislation and made special plans for the presentation of testimony. A series of eight witnesses appeared for the committee and there were a number of other organizations whose representatives testified. All testimony was in support of the bills. Your committee was gratified with the cordial reception accorded its members, who are eagerly awaiting the action of the senate committee.

Enforcement of the Mail-Order Denture Law

Although it is over two years since the Traynor Law prohibiting interstate commerce in dentures was passed, mail-order firms are still doing business. Undoubtedly, the members of the Association wonder why. The story of dentistry's ten-year fight to eliminate this racket is too long to relate; but in order to provide a background of facts, it is necessary to touch on a few highlights. It was thought that the mail-order denture business, when it first came into existence would be prevented by each state law from doing business within the state. After much energy had been expended, it was found that, when they were located outside the state, the laws would not apply. Incidentally, the law enforcement agencies of the State of Illinois, where most of the firms are located, spent considerable time and money to convict them in the state, but found, to their surprise as well as ours, that when these firms did an interstate business, the state laws did not apply. The legislative committee decided to attack the problem from another angle and succeeded in convincing the postoffice authorities that the mail-order denture business was fraudulently using the mail. Subsequently, the postal authorities tried three offenders. Two were convicted of fraud and the third was dismissed because of insufficient evidence. The two convicted were ordered to pay a fine and desist from their practice. However, the Post Office Department and also the Committee on Legislation began to realize that bringing this business to an end through convictions of fraud was an endless job; for in each case the postal authorities had to collect special evidence and frequently the convicted parties paid the fine, which was nominal, changed the designation of their ownership and went merrily on doing business. As it became evident that some form of national legislation must be enacted to eliminate this business, Congressman Philip A. Traynor, Delaware, a dentist, sponsored a bill, which passed Congress and is now referred to as the Traynor Law. It required two years of incessant work to secure favorable action on this bill by Congress. The legislative committee was pleased with the victory because it seemed that, with this federal law prohibiting interstate commerce in mail-order dentures, the mail-order denture racket was doomed. The Post Office Department decided to begin enforcement of this law on June 24, 1943. A large number of dentures were subsequently confiscated from the mails. The mail-order denture firms, realizing that the postal inspectors meant business, devised a new scheme to circumvent the law and out of their fertile brains came the prescription dentist. These men signed authorization blanks directing laboratories to construct dentures for patients whom they never saw, and for this they were paid one dollar per pre-

scription. It is a sad commentary on the dental profession that they were able to secure prescription dentists in almost every state in which they were doing business.

At the present time, activity by the postal authorities is at a standstill because the two largest mail order firms were indicted and have been tried in the courts. The Cleveland Dental Company, located at East St. Louis, Ill., the second largest of these firms, was brought to court and found guilty. Heavy fines were imposed on all concerned and the company was ordered to discontinue its mail order denture business and was placed on probation.

A large mail order denture company was brought to trial in Wilmington, Del., but the judge decided it must be tried in the place where the dentures were mailed, which was Chicago, Ill. The government appealed to the Supreme Court on this decision. In December 1944, the United States Supreme Court, by a vote of five to four, sustained the Wilmington judge.

Although this decision was somewhat disappointing, no further action was taken since the same firm was tried a little later in Chicago. It was found guilty and heavy fines were imposed. The case was appealed to the United States Circuit Court of Appeals. A recent decision of the Circuit Court sustained the lower court, finding the defendants guilty, but the company has again appealed the case to the Supreme Court of the United States, where it is now pending. The question in this instance is the constitutionality of the law. A final decision supporting the law should spell the finish of the mail-order denture business.

It is taking a long time to enforce this law, but perhaps we can find comfort in the fact that the wheels of justice grind slowly, but grind exceedingly fine.

The Chicago Office

The office of the Committee on Legislation in the American Dental Association Central Office is organized not only to foster and watch over national legislation, but also to perform an important service to the states in legal and legislative affairs. In fact, it has become a clearing house for legislative matters. Under the supervision of the secretary, the committee has developed in the central office an excellent system of files, records and reporting services, which makes it possible to keep constantly in touch with trends in dental and health legislation. The secretary, through his unusual interest, inquiring mind and agreeable personality, is rapidly gaining knowledge which will make him an authority on dental laws and dental health legislation.

The Committee on Legislation, through its Chicago office at headquarters, is equipped to serve you and invites inquiries on dental laws and legislative matters.

Social Health Trends

The legislative committee is endeavoring, by every avenue possible, to keep itself informed on social trends in health service which may lead to the enactment of legislation. It must be apparent to every thinking person that the postwar era will be evolutionary in its social changes. Every phase of our social living will be touched by these changes, including the practice of dentistry and of medicine.

The financial depression of 1929-1939 brought forth a new philosophy in government; namely, that the government should be responsible for the security of its people against social uncertainties. This philosophy was embodied in laws under the term "Social Security." The proponents of social security are seeking security against want, security against unemployment, security in ill health and

security in old age. The government, slowly but surely, through the enactment of laws, is taking over the tremendous responsibility of endeavoring to establish social security for the people in all of these phases. It is useless, no matter how keenly we may feel otherwise, to blind ourselves to the fact that all trends seem to indicate that we are approaching some form of socialized health service as part of the program of social security.

A perusal of the legislative dockets of state and national governments yields evidence that there is a growing interest in compulsory health insurance legislation. A revised Wagner-Murray-Dingell Bill which is more comprehensive than the previous bill was recently introduced in Congress. It is known as S. 1050 and H. R. 3293. A digest of this bill, which is being prepared in the Central Office, will soon be published. It is urged that our membership become thoroughly informed on this proposed legislation as we shall undoubtedly be called on to express our attitude to it and perhaps adopt a policy concerning it.

Health insurance bills were introduced into many of the state legislatures during their recent sessions. In California, there were several such bills. It is interesting to note that the executive councils of the California State Dental Association and the Southern California State Dental Association, at a joint meeting, authorized their representatives "to cooperate in formulating the dental aspects of any comprehensive program for health service in which dental services are to be included." Labor has emphatically announced through its leaders that it wants federal compulsory health insurance legislation as part of the social security program, and this group is a tremendous political and legislative power.

Federal and State Legislation

The Eberharter Bill (H. R. 2969)

The bill introduced into Congress by Rep. Herman P. Eberharter, of Pennsylvania, has for its objective the granting to a dental officer on his discharge from service of a certificate to practice in any state in the United States provided he has served one year and holds a license in one of the states. It has caused us considerable concern and has brought an avalanche of mail to our office, most of it expressing the opinion that this legislation is inadvisable.

Immediately on the release of the bill, a questionnaire was sent to every state dental association and every state board of dental examiners. The results of this inquiry indicate that, without exception, they all oppose H. R. 2969 because it is in conflict with their state dental laws and constitutes an infringement on state rights.

The general feeling has been expressed that while the veteran dental officer should be given every consideration, the decision as to what form such consideration shall take in the matter of licensure is the prerogative of the state.

New York, Oregon and Connecticut

New York, Oregon and Connecticut had introduced into their legislatures bills to license dental technicians which, in each instance, were sponsored by dental technicians and were generally opposed by the state dental associations. The bills failed to secure the favorable attention of the legislatures. It is interesting to note the growing trend toward this type of legislation, and state associations should familiarize themselves with the problems in connection with it.

The New York Dental Association sponsored a bill for the registration of dental laboratories, which passed both houses, but was vetoed by the governor.

These are only a few of the many other phases of our legislative problems.

Conclusion

The success of the creation and enforcement of dental laws, as well as opposition to undesirable dental legislation,

is a cooperative effort of every member of our association. Unless our membership disciplines itself to live up to the dental laws, we can hardly expect outsiders to respect their enforcement. The cooperation given our legislative committee by our state associations and individual members has been wholehearted and we are grateful for it. Whatever success we may have attained is due largely to the cooperation of the dentists in explaining dental legislation problems to their congressmen.

It is always well for those who are tempted to criticize our efforts to remember that to theorize is one thing, but to accomplish the desired results is another, and much more difficult. Our files contain more than fifty Congressional bills directly affecting dentistry which have been introduced into the present 79th Congress. This gives some indication as to the magnitude of our task. I solicit for the committee your confidence, your cooperation and your patience as we labor with legislative problems.—*Carl O. Flagstad, Chairman.*

PROSTHETIC DENTAL SERVICE COMMITTEE

THE PRESENT STATUS OF ACCREDITATION OF DENTAL LABORATORIES

A statement of the status of accreditation of dental laboratories at this time is desirable because of the widespread misunderstanding of the meaning and objectives of accreditation, as well as its method of operation. A great number of men have written about accreditation without knowing just what it means.

The House of Delegates of the American Dental Association at the 1944 session of the American Dental Association unanimously approved the recommendations of the Prosthetic Dental Service Committee. These have been published in the proceedings of that meeting, in the midmonth issue of THE JOURNAL and in the *Dental Laboratory Review.* A number of the recommendations included in this action have been overlooked or ignored by writers on the subject. Some of these recommendations are of extreme importance to the overall picture of accreditation and will be recalled at this time:

1. That a dental prosthetic service committee be appointed in each constituent state dental society to which will be assigned the supervising of accreditation in their respective state.

Comment: To date, twenty-five state dental societies have appointed prosthetic dental service committees. They are waiting for detailed instruction from the Prosthetic Dental Service Committee of the American Dental Association before starting to function. The Prosthetic Dental Service Committee of the American Dental Association is still in the process of developing the completed plan for the mechanics of their operation.

2. Illegal use of dental laboratories and dental technicians by dentists . . . that an active and aggressive educational campaign be conducted through the pages of the official American Dental Association journal and the state dental journals calling the profession's attention to the legal phases of such practice . . . and that our state board of dental examiners warn and prosecute violators of these illegal practices.

Comment: This recommendation has to do with reminding dentists of their responsibility in the care of the health

of the public as related to prosthetic dental service. Dentists must become acutely conscious of this dentist-patient relationship, and not permit the pressure of full appointment books to cause them to shift the responsibility to laboratories and technicians who are not prepared by training or experience to do this work. Dentists must stop such practices as sending patients to laboratories for repairs of dentures, selection of shades and molds of teeth, impressions and jaw relation records. These operations are the reponsibility of dentists who are adequately trained in these procedures, and who are legally required to do them.

These practices are a direct violation of the dental laws by the dentist who sends the patient to the laboratory and by the dental laboratory who accepts the patient from the dentist. The Prosthetic Dental Service Committee of the American Dental Association urges the various state dental boards to a vigorous investigation and prosecution of these violations.

The good dental laboratories do not wish to render these services because it takes time from their productive business to do work which the dentist should do. Dentists should not impose on dental laboratories this economic loss, nor make them party to a violation of the dental laws.

Plans for an extensive educational campaign to carry out the directions of this recommendation are being developed, and will be put into action as soon as possible.

3. That state dental societies and dentists encourage laboratory associations and dental technicians to adopt a code of ethics for the conduct of their association and craft in relationship with each other and their service to the profession.

Comment: The code of ethics of a number of laboratory organizations has been studied by the committee, and from these, and with the help of various laboratory owners, a code of ethics is in the process of development. When all of the defects and weaknesses of the code are worked out, it will be presented to the dental laboratory organizations and to the dental laboratory industry as a guide for the conduct of their associations and craft in relationship with each other and their service to the profession. The acceptance of this code will be voluntary on the part of the laboratories, but it will also be one of the requirements of accreditation by the American Dental Association.

It is not the intent of the committee that this code of ethics shall be dictatorial or highhanded on the part of the American Dental Association. It is the intent that it represent a guide to fair practice. Its content and wording are being worked out with the advice of responsible laboratory owners.

Much of the confusion and misunderstanding regarding accreditation is due to an incorrect concept of the term accreditation. The interpretation of the term by the committee is as follows: "Accreditation of dental laboratories is the recognition by the American Dental Association of dental laboratories which meet the requirements and standards for dental laboratories as set up by the Prosthetic Dental Service Committee of the American Dental Association."

The purpose of accreditation is to develop and maintain a mutually helpful relation between the dental profession and the dental laboratories for the best interest of the health of the public.

Comment: To accomplish this purpose the work of the Prosthetic Dental Service Committee consists of a four point program: (1) an educational program for dentists and dental laboratories as to their respective responsibilities under the dental laws, (2) stimulation of state dental boards to a vigorous investigation and prosecution of violations of the dental laws by members of the profession, or by the dental laboratories, or

by dental technicians, (3) encouragement of dental laboratories to use fair business practices with the dental profession and with each other by the recognition of those laboratories which meet the requirements as set up by the committee and (4) establishment of a liaison between the profession and the dental laboratory industry.

The first two points are self-explanatory. The third point is still in the formulative stage, and any one making definite statements about the requirements for accreditation or the code of ethics which is to be a requirement is speaking without authority or knowledge of the work of the committee. The mechanics of accreditation and the method of inspection are not yet worked out by the committee. Much thought is being given to this problem and advice is being sought from numerous members of the laboratory industry, as well as from many members of the dental profession. When this material is finally developed, it will be furnished to the various state prosthetic dental service committees and to the dental laboratory organizations and to individual laboratories upon request. The fourth point is to be accomplished by the establishment of a rotating standing committee of the American Dental Association, with a full-time dentist-secretary as a liaison officer between the profession and the laboratories.

Comment: The committee has decided that the time has not yet arrived when this full-time dentist-secretary should be employed. It is felt that this should be delayed until all the plans for and requirements for accreditation have been worked out. It is the thought of the present committee that this will be a means for the assistance of the American Dental Association being given to the dental laboratory industry in the solution of national and state problems of mutual concern to the industry and the profession.

There are two conditions binding upon the Prosthetic Dental Service Committee by reason of an action of the House of Delegates of the American Dental Association. These are, first, that "the adoption of the plan for accreditation shall be voluntary by each constituent society."

Comment: This gives each state dental society the option of entering into the plan for accreditation of dental laboratories or of using some other means, such as legislation, for dealing with the problems of dental laboratories. If, for instance, a state like New York decides that it would rather have legislation to license or regulate laboratories, the action of the American Dental Association does not bind it to the accreditation plan, but gives it the right to choose its own method of handling the problem. The failure to know of, or understand, this provision has caused a misunderstanding of the attitude of the chairman of the Prosthetic Dental Service Committee, Waldo H. Mork. To clarify this situation, a quotation in part from a letter written by Dr. Mork, August 3, 1945, is in order:

> The executive council of the New York State Dental Society in May, 1945, laid on the table the accreditation plan of the American Dental Association, and instructed its legislative committee to put in a new bill in January for regulating the laboratories. I never said I was opposed to the accreditation plan of the American Dental Association. I was, and still am, opposed to it for New York. The American Dental Association allows the several states to do what they wish in the matter.

It is obvious from this statement that Dr. Mork was speaking as president of the New York State Dental Society for the State of New York when he supported legislation for New York. He is well within his rights as outlined by the American Dental Association.

Second, "The application for accreditation by a dental laboratory shall be voluntary on the part of that laboratory."

Comment: The plan of accreditation is not intended to be a coercive measure. It is to be entered into voluntarily by the laboratories who wish to cooperate with the dental profession.

Those laboratories that do cooperate in the letter and spirit of the plan will be recognized by the profession and will receive in turn the support of the profession through its educational program and the official liaison of the American Dental Association. The educational program will tend to eliminate many of the practices by members of the profession and by members of the dental laboratory industry which are harmful to the profession, the industry and the health of the public.—*Carl O. Boucher, Acting Secretary.*

COUNCIL ON DENTAL THERAPEUTICS

NUPERCAINE—NOT ACCEPTABLE FOR A.D.R.

The Council on Dental Therapeutics has authorized publication of the following report.—*Donald A. Wallace, Secretary.*

Nupercaine* was submitted to the Council on Dental Therapeutics by Ciba Pharmaceutical Products, Inc., in the following package forms:

Powder—bottles of 1 gram and 5 grams.

Tablets—tubes of 20 of 0.05 gram each.

Solution 2%—bottles of 1 fluid ounce.

The powder and tablets are intended for preparation of solutions for injection and the 2 per cent solution for topical application.

The toxicity of nupercaine upon injection is admittedly high, exceeding that of cocaine. Main and Trapozzano (*J. D. Res.* 12:919, December 1932) reported nupercaine 28 times more toxic than procaine for guinea-pigs, 22 times more for cats and 21 times more for dogs. Used in the recommended concentration of 1:500, it is approximately twice as toxic as the commonly used 2 per cent procaine solutions, and the duration of the anesthesia produced by administration of nupercaine is markedly longer.

Using a 4 per cent aqueous solution of nupercaine diluted with an equal volume of 1:1,000 solution of epinephrine hydrochloride, Dobbs tested its usefulness as a topical anesthetic (*J. D. Res.* 14:218, June 1934). He found that ". . . profound anesthesia was not obtained; only slight anesthesia was induced. A tingling sensation in mucous membranes, especially in the tongue, gave the impression that anesthesia was present. When a sharp instrument was passed through the mucosa, pain was felt in all cases."

Tainter, Throndson and Moose (J.A.D.A. 24:1480, September 1937) reported a blindfold test evaluation of a number of anesthetic agents for topical use. They reported nupercaine only partially effective under their conditions and concluded that since the concentrations used were the highest recommended, nupercaine, among others, was not entirely suited for topical anesthetic purposes in the mouth.

On the whole, its usefulness is problematic in dentistry, and it may be doubted whether it has any advantages over currently used agents and measures on the oral membranes, even though nupercaine may be useful locally in skin conditions.

The recommendation of Barkann (J.A.D.A. 26:61-68, January 1939)

*Nupercaine is the registered trade mark of Ciba Pharmaceutical Products, Inc., for its brand of dibucaine.

that 2 per cent nupercaine to which sodium bicarbonate is added is an effective topical anesthetic agent for the gums appears to be of questionable validity. For the same periodontal surgical procedure, Barkann also recommends a mixture of phenol 25 per cent and camphor 75 per cent "to disinfect and cauterize granulation tissue before and after excision."

The latter mixture may well account for any anesthesia prevailing at operation.

In view of the relatively high toxicity of nupercaine in recommended concentration for injection without demonstrated superiority and safeness over procaine, and with uncertain, if any, advantages as a topical anesthetic agent over other agents or measures for use in the mouth, the Council voted that nupercaine be declared unacceptable for A.D.R.

ACCEPTED DENTAL REMEDIES

The Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following products in the list of Accepted Dental Remedies:

*Penicillin and Related Preparations**

Penicillin (Sodium Salt)-C.S.C., in vials, each containing 100,000 Oxford Units.

Penicillin (Calcium Salt)-C.S.C., in vials, each containing 100,000 Oxford Units.

Manufactured by Commercial Solvents Corporation, Terre Haute, Ind., and New York, N. Y.

Penicillin (Sodium Salt)-Heyden, in vials each containing 100,000 Oxford Units; in vials, each containing 200,000 Oxford Units.

Penicillin (Calcium Salt)-Heyden, in vials each containing 100,000 Oxford Units.

Manufactured by the Heyden Chemical Corporation, New York, N. Y.

Penicillin (Sodium Salt)-Merck, in vials, each containing 100,000 Oxford Units; in vials, each containing 200,000 Oxford Units.

Penicillin (Calcium Salt)-Merck, in vials, each containing 100,000 Oxford Units; in vials, each containing 200,000 Oxford Units.

Manufactured by Merck & Co., Inc., Rahway, N. J.

Admission of a product to the list of Accepted Dental Remedies means that the product and the methods by which it was marketed at the time of consideration were not found to be in violation of the Council's published rules. Accepted products are reconsidered periodically. The files of the Council contain information on many drugs and dental cosmetics which is available upon request, and inquiries are welcomed.—*Donald A. Wallace, Secretary.*

*A.D.R. Ed. 11, p. 162.

CASES AND COMMENTS

Army Dental Corps Regulations

*Editor's Note: The following letter has been received from an Army dental officer of considerable experience. The signature has been withheld for obvious reasons. The matters presented are of particular interest because of complaints of long standing on the regulations that govern the Army Dental Corps and because changes in regulations have recently been announced.**

To the Editor: There is little doubt that dentistry is on the threshold of important changes. Since the outbreak of war, the demand for dental service has increased enormously. Meeting that demand is one of the major problems of the profession.

The future will see millions of young men and women from the Armed Forces returning to civil life. Most of them, for a considerable period, will have been dependent on government agencies for their dental care. Some will have received dental treatment for the first time. A high percentage will not have received adequate dental attention. Their concepts of dentistry will be a major factor in molding public opinion concerning the profession.

Many statistical data have been published relative to the volume of dental service provided by the Army and Navy. These statistics should be regarded with some reserve, as the scope of dentistry in the Army does not include to any considerable extent many important procedures normally provided in civilian practices. It is extremely doubtful whether the volume per operator attained by dentists in civilian practice has been equaled by dental officers. It is certain that the variety has not.

The Army has done a creditable job of providing a great number of persons with plastic fillings, extraction service and partial and full dentures. Frequently, there has not been opportunity for proper adjustment and fitting of dentures. The volume of other procedures has been negligible, and it has been necessary to secure such service from dentists in civil practice.

The facts of the situation are well known to many of the dentists who have had long periods of duty in the Armed Forces. These men have acquired much information and experience in the conduct of dental service in these organizations. Their suggestions and recommendations should be given careful consideration in reorganizing the dental service in any government agency. In the Army, dental officers have never been given an opportunity to organize and administer a dental service commensurate with the potentialities of American dental science.

From an administrative standpoint, it is evident that there are many things fundamentally and basically wrong with the dental setup in the military organization. Although dental officers are in a way charged with the responsibility of providing a dental service, Army Regulations circumscribe their activities by placing the Dental Corps completely under the domination of the Medical Corps, so that initiative and freedom of action are stifled, and dental officers are in fact frequently prevented from carrying out what should be their rightful mission.

Army Regulations provide for the administration of the Dental Corps as follows (A. R. 40-15 par 2): "Matters relating to the dental service as a whole are administered by the Surgeon General with the advice and assistance of the Dental Corps assistant to the Surgeon General; in a Service Command or other commands, matters relative to the dental service are similarly administered by the Chief of the Medical Branch with the advice and assistance of the dental assistant to the Chief of the Medical Branch, or dental surgeon of other commands." This regulation establishes the status of dentistry in the office of the Surgeon General, and on down through all the commands of the Army.

The dental assistant in the office of the Surgeon General may or may not be consulted in matters of primary importance to the Dental Corps. It is a fact that his

*J.A.D.A. 32:1222, September 15, 1945.

opinion is not even asked in many important decisions affecting the dental service. It is highly significant that no memorandum, bulletin, directive or other official document controlling the administration of dentistry has ever come from the Surgeon General's office signed by a dental officer.

The dental assistant to the Surgeon General serves in an advisory capacity only. He has no real authority and no direct control over dental personnel, professional standards, dental installations (such as dental dispensaries, clinics and laboratories), procurement and issue of dental supplies, research or the Dental Corps budget. Any action affecting administration of the Dental Corps is the result of orders issued by the Surgeon General—a Medical Corps officer.

The principle established in A. R. 40-15 extends to Service Commands and on down to the regimental medical detachments. Regardless of a dental officer's rank, qualifications or ability, he is in charge of his own dental clinic and activities only so far as the medical officer sees fit to permit him to be.

Occasionally, senior dental officers serve under Medical Corps officers junior to them. This does not alter the fact that the medical officer prepares the dental officer's efficiency report, approves or disapproves recommendations for promotion and approves or declines his application for transfer or leave. The medical officer may establish the dental officer's working hours. He acts on the dental officer's requisitions for supplies and equipment regardless of the fact that, in most instances, he is entirely unfamiliar with the items involved or the rate at which they are normally expended. He assigns the dental assistants or relieves them from such duty at will. He has the power to defeat the purpose of dentistry if he so desires.

The absurdity of such a plan of organization for an efficient dental service is at once apparent. It would not be tolerated in any dental college or dental clinic in civilian life, nor in private practice. No one in the dental profession would deny to medicine full credit for the marvelous advances that it has made in the treatment and prevention of disease. The fact remains that medical officers do not and cannot perform the usual dental operations. They are entirely unfamiliar with dental instruments and supplies and the requirements for an efficiently planned operating room or laboratory.

Dentistry is a separate and highly specialized profession. Successful operation of an efficient dental service requires utilization of experts to organize and administer it. They must be free to make their own decisions and to work without interfefence from officers of another corps who are entirely unfamiliar with the problems to be solved.

The fact that the present system discriminates unjustly against the Dental Corps is not the most important reason for demanding a change. The basic reason is that the present service is inadequate and inefficient. This will be corroborated (substantiated) by the returning service men. The Dental Corps has been denied the opportunity to organize and administer a dental service with standards comparable with those of modern American dental practice. The Medical Department is responsible for this situation and must face the criticism which it will inevitably receive.

It is useless to deplore the situation or to indulge in criticism if no constructive suggestions are offered. The problem admittedly exists. What solution can be offered?

Sound basic policy requires that the Dental Service be organized and administered exclusively by dental officers, responsible directly to commanding officers—not indirectly through the Medical Department.

Reorganization of the Dental Department would necessitate radical and far-reaching changes. It is not the intention to include in this paper the details of necessary changes in Army Regulations, but rather to state briefly, but specifically the essentials to be included in such a plan.

The items involved are personnel; professional procedures and research; installations and equipment; supply, and the budget.

Personnel

All commissioned and enlisted personnel should be assigned permanently to the Dental Department.

Recommendations for the procurement, assignment, transfer, promotion and discharge of all dental personnel should be made directly to the Adjutant General's office by Dental Corps officers.

All training should be under the supervision of dental officers. There should be ade-

quate opportunity for specialized training and advancement for chair and clerical assistants, technicians and dental hygienists. Appropriate ratings in the Dental Corps up to and including master sergeant should be provided for enlisted personnel. Careful consideration should be given to the desirability of commissioning dental hygienists and senior technicians in charge of laboratories.

The dental surgeon (senior dental officer) of each station or command should be responsible directly to the commanding officer —not indirectly through the surgeon. He should be a member of the special staff of the commanding officer.

At general hospitals, the dental surgeon should be chief of the Dental Service, responsible directly to the commanding officer.

The Medical and Dental Services should operate (function) independently, but cooperate for the benefit of the command under direction of the commanding officer in the same manner in which infantry and artillery cooperate in a combat team. Two branches of the healing art can effect this cooperation on the basis of their codes of ethics at least as effectively as two other branches of the service.

Professional Procedures

All dental professional procedures and research should be under the complete control of Dental Corps officers.

Installations

Recommendations for the procurement, construction or alteration of premises designed for use as dental clinics, infirmaries, dispensaries, laboratories, etc., should be made exclusively by dental officers.

Dental officers should have the right to hospitalize such patients as in their judgment would benefit by hospitalization.

Supply

The procurement, storage and issue of dental supplies should be placed exclusively in the hands of the Dental Corps.

A dental supply table should be prepared by dental officers.

The Dental Corps should be given authority to anticipate needs in advance of threatened hostilities, and to place contracts which would assure delivery of necessary supplies on an effective schedule. This would help to eliminate the delays resulting in the present war from Medical Department supervision over procurement of dental supplies.

Budget

The Dental Department should have the authority to prepare its own separate budget, covering all expenditures for the dental service.

The establishment of a separate Dental Department represents a radical change. The importance of dental health and the increased efficiency in rendering dental service justify it.

It is to be expected that the Medical Corps will oppose such a plan. Experience has shown that they are reluctant to relinquish control over personnel, administration and finances, since these are used to justify increases in rank and authority for the Medical Department.

The burden of their argument is the same as that advanced over 100 years ago when dentistry established a separate educational system—that dentistry is incapable of handling its own affairs.

The progress of the profession of dentistry in America, where it is separate and independent, as compared with that in Europe, where dentistry has been under the domination of medicine, is ample proof of the ability of the dental profession to administer its own affairs effectively.

The Medical Department has consistently refused to make adequate changes in Army Regulations to reorganize the dental service. It has consistently opposed corrective legislation at congressional hearings.

In view of these facts, it becomes evident that the only hope of improving dental service in the Army is an aggressive campaign on the part of organized dentistry for such legislation.

The facts are known to many open-minded and impartial legislators in the Congress. There is reason to believe that such legislation can be passed.

If such is the case, the dental profession of America owes it to the men and women in the armed forces to spare no effort to secure legislation which will assure them the type of dental service that American dentistry is capable of providing.

BOOK REVIEWS

Prescription Writing and Materia Medica for Dentists. By L. Richard Cipes, Ph.G., D.D.S. Attending Dentist, New York City Department of Health, Attending Dentist, Mt. Vernon, N. Y. Department of Health, Member Alumni Committee Columbia University College of Pharmacy. Formerly Instructor in Oral Surgery, New York University College of Dentistry. Director of Dental Research, Montefiore Hospital, New York City. 295 pages. Second Enlarged Edition. Price $5. New York: Dental Items of Interest Publishing Co., Incorporated, 1945.

The author should be complimented on his attempt to persuade dentists to write prescriptions more frequently. He offers a large number of simple prescriptions and a long list of drugs and other ingredients which might be used in prescriptions.

However, the book is so loosely written, with a list of drugs so uncritically selected, that it cannot be recommended to the dentist, who might be more misled than accurately informed by a perusal of it. Some examples of its inaccuracy and lack of reliability will be discussed here.

In the preface to this revised edition, the author acknowledges suggestions and assistance from "Dr. Samuel M. Gordon of the Council on Dental Therapeutics of the American Dental Association." Dr. Gordon, who was at one time the secretary of the Council on Dental Therapeutics, has not been associated with the Council or with the American Dental Association since November 1937. In the first two pages of the text of the book, serious charges are made with regard to the safety of certain types of dental products without naming the products.

On page 38, a disparaging statement is made with regard to the possibility of harm to the dental pulp from the presence of a small quantity of arsenic in U.S.P. Zinc Oxide; while, on page 237, a fluoride desensitizing paste is listed without any caution or warning statement.

More than fifty products and prescription ingredients which are not accepted by the Council on Dental Therapeutics are listed in the book in such a way as to give the reader the impression that they are suitable for use in dentistry. Some of these, for example surgical maggots, parathyroid hormone, potassium chlorate, orris root and ergot, would probably arouse suspicion in the minds of most dental readers, but the disadvantages of others are less well known.

An excessive amount of space is given to the sulfonamides and penicillin, in view of the limited known usefulness of these drugs in dentistry. Undue importance is attributed to mouth washes. The old claim to the effect that monocaine is synergistic with epinephrine is perpetuated. It is also stated, without adequate authority, that monocaine is four times more efficient than procaine as a local anesthetic. Proprietary and unfamiliar names for drugs and excipients are used in such a manner that the reader could easily be led to suppose that they were the common names in many instances. It is difficult enough for the average dentist to keep track of the drugs that may be offered to him without being confused by the indiscriminate use of a wide variety of synonyms, some of which apply accurately to only one brand of the product.

The reader is advised by the author to consult other texts for basic pharmacologic and therapeutic information, much of which might better have been included in this book.

NEWS OF DENTISTRY

Plan to Enroll Discharged Veterans in Dental and Medical Schools to Alleviate Shortage

With the nation facing a serious shortage of physicians and dentists in the postwar period, Paul V. McNutt, chairman of the War Manpower Commission, announced plans August 21 to enroll immediately, from among veterans now being discharged from the armed services, 12,000 students for medical, dental, premedical and predental school courses, beginning this fall.

Mr. McNutt said surveys show that even if medical school enrollments, admissions and graduations had been maintained at levels prevailing before recent changes in Selective Service policies, there still would have been a postwar shortage of thousands of doctors and an even severer shortage of dentists.

"Unless we move quickly and successfully to wipe out the gaps torn in the ranks of the medical and dental professions by the exigencies of war, America will be denied essential security in terms of national health," Mr. McNutt said.

"The situation is so severe that some medical schools will not fill any substantial part of their first-year classes beginning next month," he added.

With a goal of 8,000 students for medical and premedical schools and 4,000 for dental and predental schools, the War Manpower Commission, with the cooperation of the Army, the Navy, the Veterans Administration and the medical and dental professions, will place the story of the opportunities in the medical and dental professions before men in the armed forces who are scheduled for discharge in the near future.

Information concerning these opportunities will be included in various publications reaching soldiers, sailors and marines in various parts of the world, with an explanation of the financial assistance available under the G. I. Bill of Rights. In addition, more comprehensive information will be furnished counselors and education officers in assembly areas.

The medical and dental professions will supply lecturers for the counselors in separation centers so that professional students returning from service with the armed forces can be properly advised of the opportunities in medicine and dentistry. Counselors at separation centers will be supplied with more detailed information, including the prerequisites of medical and dental schools.

At all separation centers the most likely candidates for medical and dental and premedical and predental schools will be screened on the basis of their qualifications and expressed interest.

Educational information will also be supplied to interested and qualified prospects through veterans employment representatives in local offices of the United States Employment Service, the Veterans Administration and local Selective Service boards.

While nearly 40 per cent of the active practicing physicians of the United States are now in the armed forces, the chief concern at present is not only the wartime supply of physicians and dentists for civilians, but also the supply of physicians and dentists for veterans and the peacetime armed services. As a consequence of the war, Mr. McNutt said, many more physicians will be needed than were available before the war. Present estimates are that a peacetime

Army will require 10,000 physicians, a peacetime Navy about 5,000 and the Veterans Administration about 15,000.

A similar situation prevails in the field of dentistry except that the supply of dentists was already falling rapidly before the war. From 1910 to 1940, the number of graduates in dentistry decreased 23 per cent, while the population of the United States increased 42 per cent. The preponderance of the older age groups is shown by the fact that of the dentists practicing in the United States in 1940, 25 per cent had been graduated before the year 1910. This meant that the dental profession at the beginning of the war was numerically inadequate to care for the health needs of the American people, Mr. McNutt said. The demands of the military forces reduced the number of dentists whose services were available to civilians by about a third.

As a result, the health care now being given the civilian population by those in private dental practice is principally emergency work. There has been untold neglect of the oral health of all the people, especially children, which is piling up a backlog of oral defects for which the dental profession must assume responsibility, Mr. McNutt said.

Unless the search for students among veterans is successful, it is unlikely that many dental schools of the country will be able to fill freshman classes this year, Mr. McNutt said. Surveys indicate that instead of the several thousands needed, actual freshman enrollment will not exceed a few hundred. The success of the new program is therefore essential to the health and welfare of the American people both at present and in the years to come, for, without additional medical and dental personnel, there can be no assurance of the maintenance of American standards of health, Mr. McNutt said.

The release also provided the following information for discharged veterans and their counselors on the study of dentistry, aid to be secured through the G. I. Bill and sources of additional data:

Dentistry: The following statement of the prerequisites for the study of dentistry was prepared by the Council on Dental Education and may be regarded as official:

The minimum requirement for admission to an approved dental school is the successful completion of two full academic years of work in an accredited college of liberal arts and sciences. The applicant for admission to a dental school must present evidence of his having successfully completed two full years of college work based upon the completion of a four-year high school course, and shall have completed all requirements for advancement to the junior year in the arts and sciences college in which his latest credits were earned. His scholastic attainments as evidenced by the records shall be of such quality as to insure a high standard of achievement in the dental course.

The basic college course of two years must include at least one year's credit in English, biology, physics and inorganic chemistry and at least one-half year's credit in organic chemistry. All science courses must include both class and laboratory instruction. These basic requirements are observed strictly by all dental schools in the United States.

Some dental schools offer admission on deviations from prescribed requirements under certain specific conditions. Formal credit in biology or physics, but not in English or chemistry, may be waived at the discretion of the school in the case of exceptional students with three years of college work or in the case of those holding bachelor or other degrees from accredited arts and sciences colleges.

In the selection of students to begin the study of dentistry, the schools consider particularly the candidate's proved ability in secondary education and his successful completion of the basic courses and any advanced courses supplemental to the basic ones.

Students in approved schools of medicine who have completed two or more years in a medical school, with a quality of scholarship acceptable to the standards for promotion in the medical school in which the work was completed, may be given advanced standing provided the applicant completes under competent regular instruction the courses in den-

tal technology regularly scheduled in the earlier years of the dental curriculum. In order to gain admission to predental courses, applicants must present to the accredited college of his choice a record of the successful completion of a four-year high school course with a quality of scholarship that entitles him to recommendation for admission to college by the principal of the high school from which he graduates. Those applicants who may enroll in an accredited college as predental students should include in their predental schedule the prescribed subjects; namely, English, biology, chemistry and physics.

The "G I Bill": Adequate preprofessional and professional training in medicine or dentistry is expensive and requires six years (or more) in medicine and five years (or more) in dentistry, depending upon the particular school, advanced credits and the student's scholastic record.

Veterans of World War II may take advantage of the scholastic benefits to which they are entitled under the "G I Bill of Rights" to study medicine or dentistry, or premedicine or predentistry. These benefits include tuition, fees, books, equipment and allowances for subsistence. The amount and type of benefits for which a veteran is eligible depend largely upon his age and the length of his service. Each potentially eligible veteran should make inquiry about his educational benefits to the nearest office of the Veterans Administration because only that agency can answer his questions authoritatively.

The "G I Bill" clearly provides that an eligible veteran must be fully acceptable to the school that he seeks to enter. This decision cannot be foretold by anyone except the school and, accordingly, the veteran should be urged to carefully consider the choice of a school and to get into direct contact with that school promptly. The evaluation of college courses or transcripts should be undertaken only by the school authorities and only by the school to which the prospective student intends to seek admission.

Information: Although representatives of several government agencies are cooperating with the medical and dental professions in the present effort to find those veterans who are interested and qualified to study medicine or dentistry, inquiries for further information should be handled in such a way that prospective students get direct and immediate answers to their questions. For this reason, the participating agencies are requested to advise those seeking additional general or specific information (1) to write to the post office box indicated under paragraph 3 below, (2) to discuss the whole situation with the nearest college authorities (especially those interested in preprofessional training) and with the family physician or dentist and (3) to select a school and apply for admission as soon as possible.

More specifically, each interested veteran should explore as many of the following sources of information as possible:

1. Educational counselors at assembly areas abroad and at each Army separation center. These counselors are prepared to talk with each veteran at length and have information on the study of medicine and dentistry, including premedicine and predentistry.

2. Consultants designated by the medical and dental professions. There are one or more such consultants at or near each Army separation center.

3. Approved schools. General information on the choice of a school of medicine or dentistry, including a list of the approved schools (but not including the evaluation of college credentials) is available on request at no charge by writing to (a) P. O. Box 457, Chicago 90, Ill., for medicine, (b) P. O. Box 688, Chicago 90, Ill., for dentistry.

4. Family physician or dentist. The family physician or dentist is well aware of the personal characteristics demanded in daily practice and a first-hand view of the rewards and satisfaction as well as the problems incident to successful practice.

Board of Trustees to Meet in Chicago October 17-19

The Board of Trustees of the American Dental Association will meet in the Central Office, October 17-19, according to Harry B. Pinney, General Secretary. Plans for the next Annual Meeting, in 1946, will be discussed along with other problems associated with the ending of the war.

Army Announces Point Plan for Officers

The War Department announced plans September 6 for a point system which will release approximately 200,000 Army officers who are eligible for immediate discharge. Individual scores will be recomputed as of September 2, 1945. Credit will be given for service, overseas duty, combat awards and parenthood since V-E Day.

Effective immediately, the initial critical scores are: colonels, lieutenant colonels and majors, 100; captains and first and second lieutenants, 85; warrant and flight officers, 80; nurses, 65; WAC officers, 44; physical therapists and dietitians, 41. No provision was made for the release of officers above the rank of colonel.

The points will be computed upon this basis: one point for each month of service since September 16, 1940; one additional point for each month served overseas since that date; five points for each major campaign; five points for each medal won (including all medals from Bronze Star and Purple Heart up to Medal of Honor); twelve points for each child under 18, up to a limit of three children.

The War Department said that the point scores would be lowered progressively in proportion to the rate of the demobilization of enlisted personnel, and approximately 600,000 officers would be separated for all reasons by July 1, 1946. Directives have been sent to all theaters of operations, continental defense commands and major forces that all officers qualifying for discharge under these scores will be reported for separation within sixty days.

Officers eligible for discharge under the point system who desire to be retained on active duty will be required to sign the following statement:

"Regardless of any eligibility which I may have now, or in the future, for relief from active duty under Readjustment Regulations, I elect irrevocably to continue on extended active duty for the duration of the emergency and six months, unless sooner relieved."

Procurement Objectives Are Canceled by War Department

All procurement objectives for the Army of the United States have been canceled in keeping with a directive issued September 2 by W. L. Day, Adjutant General. Unexpended portions of procurement objectives have been canceled, and all requests for commissions on which no final action has been taken will be returned "without action."

Rowntree Thanks Dentists for Selective Service Work

Col. L. G. Rowntree, who retired recently as chief of the Medical Division, National Selective Service System, has issued a letter thanking dentists and physicians "who have contributed so liberally of their time, effort and skill in handling the medical problems of the registrants."

The full text follows:

In retiring from Selective Service, after serving as chief of the Medical Division during the last four and one-half years, I have received literally dozens of letters complimenting us on what has been accomplished. Most of these letters, I note, came from physicians. In reading them and in thinking over the situation, it seems to me that the shoe really should be placed on the other foot. Hence I am writing to express the gratitude of the Medical Division of Selective Service to the 35,000 doctors and 10,000 dentists who have contributed so liberally of their time, effort and skill in handling the medical problems of the registrants.

No other group of people in the nation have given more liberally of themselves in the war than have these professional people. That was the opinion expressed by the late President Roosevelt at one of his wartime conferences.

The Medical Division of Selective Service in National Headquarters in Washington has enjoyed the complete support of the director, Maj. Gen. Lewis B. Hershey. It has had also the strong support and superlative leadership from the three Surgeons General of the Army, Navy and Public Health Service, from all the state headquarters and especially from all the state medical officers. The physicians attached to the 6,443 local boards, the consultants on the 660 medical advisory boards supplied all the demands made on them. They met fully and completely the nation's needs in the procurement of manpower for the fighting forces.

Such service should not be taken for granted nor should it be passed over without acknowledgment. Medicine has done a grand job in this war in Selective Service as well as in the Medical Corps of the Army, Navy and Public Health Service.

In leaving Selective Service I wish to express to all the civilian physicians and dentists in the Selective Service System my personal appreciation and that of the Medical Division at National Headquarters for the wholehearted service they have rendered throughout the last four and one-half years.

Navy to Release 8,500 V-12 Students in November

The Navy has announced that it will release about 8,500 V-12 students taking dental, medical, theological, predental, premedical and pretheological training to inactive duty November 1. The remaining 25,500 students in the V-12 program will graduate or continue their training in college as apprentice seamen on active duty. Final disposition of all students in the program will be made by June 1946.

About 1,450 dental and 5,700 medical students will remain on active duty until the end of the semester now current, or starting, before November 1, the Navy said. Another 1,500 V-12 students entering dental or medical school this fall will remain on active duty for one term. Dental and medical students will be returned to inactive duty as enlisted men and subsequently will receive probationary commissions in the Naval Reserve and will be retained on inactive duty. There are 1,056 predental and premedical students in the program who will return to inactive duty as apprentice seamen on November 1.

Dental Equipment Contract Ended by Bureau of Medicine and Surgery

The Bureau of Medicine and Surgery has canceled a contract for dental equipment totaling $164,000, according to a recent announcement from Vice Adm. Ross T. McIntire, Surgeon General. Contracts for medical supplies and equipment aggregating $11,500,000 have now been terminated by the bureau. Many of the cut-back contracts were for dental items, drugs, biologic products, chemicals, surgical instruments and other supplies that can be channeled speedily to civilian markets.

Army to Release More Medical Officers

The Army will release 10,000 dentists, 30,000 physicians and 40,000 nurses by next July 1, according to a release from the War Department, September 14. Army dentists and physicians will now be released under the following conditions:

If they were in the service before December 7, 1941; if they are 48 years old or over; if they have 80 or more points for discharge under the Army's point system.

Under the new discharge system, the Army estimates that 3,500 dentists, 13,000 physicians and 25,000 nurses will be returned to civilian life by January 1. The new discharge system will affect only Medical Department officers and is separate from the regular officer discharge system previously announced. The Army Surgeon General promised even further liberalization of the plan before the end of the year in order to release more surplus medical officers as quickly as possible.

Establish Priorities for Sale of Overseas Surplus Property

The Army and Navy have issued the following joint statement on priorities to be given in the purchase of overseas surplus property:

The Army-Navy Liquidation Commissioner's Office has directed its field commissioners to give priority in the purchase of overseas surplus to U. S. Government agencies for their use in foreign areas, according to Commissioner Thomas B. McCabe, who is in Europe conferring with his field commissioners.

The directive was issued as a result of the establishment of overseas surplus sales priorities by the Surplus Property Board in an amendment to Regulation 8, which governs overseas sales disposal, Mr. McCabe said.

Top priority will include sales of overseas surplus to the Foreign Economic Administration, not only for its own use in foreign areas, but also when acquiring property under Lend-Lease appropriations, or for UNRRA.

The next opportunity to make purchases is accorded to American nonprofit institutions. These institutions include any American scientific, literary, educational, public health, public welfare, charitable or eleemosynary institution, and any hospital or similar group, as defined in the amendment to SPB Regulation 8.

American manufacturers or distributors come next in the order of priorities for the purchase of surpluses with their own name or trademark, for use or disposal in foreign areas, so that they will be in a position to protect their brands and to repair, service and distribute their merchandise in an orderly fashion. All purchases of this character will naturally be subject to the regulations of the country in which they are to be sold.

Foreign Governments are next in the order of priorities, regardless of the location of the surplus property, in making purchases for relief, rehabilitation and reconstruction purposes, as may be determined by the field commissioners, after consultation with the State Department or its missions, and the Foreign Economic Administration.

Next in order is the country where the surplus is located, if it is desired for purposes other than relief, rehabilitation and reconstruction; and, finally, any other purchasers, including any other foreign governments as may be determined by the field commissioners.

Navy Releases More Men Under New Point System

The Navy has liberalized its point discharge system to grant one quarter of a point for every month's service outside continental United States since September 1, 1939, according to a release made September 9. The change, effective September 15, will make an additional 423,000 naval personnel eligible for discharge, Navy Secretary Forrestal estimated. The point score for dentists and physicians was fixed at 60.

Old point credits, which continue in effect, were: one half point for each year of age to the nearest birthday; one half point for each month of active service since September 1, 1939, and 10 points for dependency, regardless of the number of dependents.

WPB Releases Control on Dental Bur Manufacture

The War Production Board on August 23 released control over the manufacture of dental burs, according to a recent report from C. Willard Camalier, chairman of the War Service and Post War Planning Committee. According to the release by the board, "Before the end of the Pacific war, the division had contemplated the revocation of the dental bur orders because of expected greater production. Similarly, the laboratory equipment situation had so changed, with the slackening of demand for some items and the freeing of the supply of other items, that this order would have been relaxed very shortly, had the war in the Pacific not ended when it did. During the war years domestic production of dental burs increased, to compensate for the imports which were cut off, and the increased demand. It is

anticipated that between now and the first of the year, enough burs will be available to meet the needs of the civilian dental profession adequately."

The ruling, which limited the sizes and types of dental excavating burs that could be made, also was revoked by the board.

Missouri Legislature Passes "Doctor Prefix" Bill

A bill known as the "Doctor Prefix" bill (House Bill 206) has recently been passed by the Missouri State Legislature and signed by Gov. Phil M. Donnelly. The new law will require that a dentist add the degree D.D.S. after his name whenever the word "Doctor" or "Dr." is used before the name on office nameplates, cards, signs and stationery. The law also applies to physicians, osteopaths, veterinarians, chiropractors, chiropodists and any other persons who profess to practice the healing art and who use the prefix "Doctor" or "Dr."

President Promises Health Message Soon

The recent message that President Truman addressed to Congress indicated that an additional statement on health legislation would soon be forthcoming. The President said, "I shall shortly communicate with the Congress, recommending a national health program to provide adequate medical care for all Americans and to protect them from financial loss and hardships resulting from illness and accident."

Social Security Observes Tenth Anniversary

The Social Security Board is this year observing the tenth anniversary of its founding. On August 14, 1935, the Social Security Act became a law, with President Roosevelt's signature. Paul V. McNutt, Federal Security Administrator, recently made public a Social Security Board report showing that 4,250,000 men, women and children in all sections of the country are now receiving cash benefits that aggregate $111,000,000 a month. Since the act became a law in 1935, social security payments to individuals have approximated $9,000,000,000.

Plan Cabinet Seat for Chief of Federal Welfare Services

Presidential plans for a regrouping of the Government's labor and welfare functions to meet the immediate and pressing problems of peace were announced in press dispatches August 19.

Creation of a new department of public welfare, in line with President Truman's purpose of bringing all possible Federal activities under the wings of the Cabinet, was known to be spotted prominently on the remodeling blueprint.

The Welfare Department would include the Social Security Agencies, the Public Health Service, the Office of Education and probably the Children's and Women's Bureaus, now part of the Labor Department. Mr. Schwellenbach reportedly would like to rid his department of the latter two agencies.

The Secretary of Welfare, if the plan were approved, would be the first new member added to the Presidential Cabinet since 1913, when the Department of Labor was established.

Public Health Service Offers Health Research Fellowships

Fellowships for graduate work in health research are being offered to qualified applicants by the United States Public Health Service, according to a recent announcement from Director R. E. Dyer, Assistant Surgeon General. The fellowships are being offered to provide opportunity for study and re-

search at the National Institute of Health or some other institution of higher learning, in association with highly trained specialists in the candidate's chosen field.

Junior fellowships, which provide a stipend of $2,400 a year, will be available to those holding a master's degree in the sciences allied to public health, from institutions of recognized standing. Senior fellowships will be available to those holding a doctor's degree, with a stipend of $3,000 a year.

For further information, letters should be addressed to the Director, National Institute of Health, Bethesda 14, Md.

Dental Records Completed in Grand Rapids Caries Experiment

The dental records of 28,000 school children in Grand Rapids, Mich., have now been completed in a dental caries experiment in which sodium fluoride has been added to the city's water supply. The examinations were conducted before 1 part per million of fluoride was added to the municipal water supply in December 1944. Dentists of the U. S. Public Health Service are now examining 5,000 school children in Muskegon, Mich., which was chosen as the control city. Periodic examinations will be made of school children in both cities to note any changes in the dental caries rate.

The study is being conducted by the University of Michigan, the U. S. Public Health Service and the Michigan Department of Health.

Hagan Reassigned in Public Health Service

Dental Surgeon Thomas L. Hagan, of the U. S. Public Health Service, has been reassigned to Public Health District 4, with headquarters in New Orleans, La., after completing his public health course at the University of Michigan in June.

U. S. Public Health Service Assigns Kroschel to Chicago

The States Relations Division of the U. S. Public Health Service has announced the assignment of William P. Kroschel to the district office in Chicago. Dr. Kroschel, who has been on assignment with the Coast Guard, has just returned from an eighteen months' tour of duty in the South Pacific.

Marshall, Texas, to Fluorinate Water Supply

The City Commission of Marshall, Texas, has recently approved an appropriation of funds for treating the city water supply with one part fluoride per million, treatment to extend over a ten-year period. The Dental Department of the State Board of Health, Edward Taylor, director, will have charge of the experiment, with the assistance of Marshall dentists.

Therapeutics Council Adopts New Design for Acceptance Seal

The seal of acceptance of the Council on Dental Therapeutics has been redesigned in order to modernize its appearance and increase the legibility of its wording.

The statements on the seal of acceptance have not been changed and its significance remains the same. The Council will allow the commercial firms which distribute accepted products a period of three years in which to change to the new design. In all instances, the change will be made as soon as possible.

WPB Releases All Restrictions on Penicillin

The War Production Board has announced that, as of August 31, all restrictions on the use and allocation of penicillin are removed.

Generals Hawley and Cutler Join Veterans Administration

Maj. Gen. Paul R. Hawley, formerly Chief Surgeon of the European Theater of Operations, and Brig. Gen. Elliott C. Cutler, Chief Medical Consultant with the European Service of Supply, have joined the Veterans Administration staff in Washington, according to a recent announcement from the Office of the Surgeon General.

General Hawley will serve as medical adviser to Gen. Omar N. Bradley, Administrator of Veterans Affairs. General Cutler will be attached to General Hawley's staff. Both General Hawley and General Cutler have been lent on a temporary basis to the Veterans Administration.

Fifty-Seven Candidates Pass National Board Exams

Fifty-seven candidates have successfully passed Part II of the National Board examinations, held April 23 and 24, according to a recent communication from Gordon L. Teall, secretary of the National Board of Dental Examiners. Names of the candidates who passed the examinations are as follows:

Atlanta-Southern Dental College, Emory University: Robert S. Paulson, Albert S. Johnson.

Baltimore College of Dental Surgery, University of Maryland: Bruce T. Mathias, Leon M. Mazotta, Albert M. Dunn, Gerald J. Rose, Frank P. Gilley.

Kansas City-Western Dental College, University of Kansas City: Clifford R. Clarke, Frank B. Fimple, Robert W. Rasmuson, Edward A. Abernethy, John J. McCrory, Billy Neil Stone, James W. Barnett, Robert D. Kincaid, Clayton K. Mammel, Earl H. Mabry, Howard H. Mirikitani.

Dental School, Northwestern University: Reid Engelmann, Robert W. Sandquist, James M. Munro, Leo Harnden, John T. Marshall, Robert F. Johnson, Cecil C. Warren, S. Elmer Bear, Robert M. Wild, John W. L. Stilley, Edward J. Fredrickson, Gerard J. Chudzinski, Dale F. Rasmusson.

Tufts College Dental School: Harold F. Bosco, Harold G. Jacobs, Margaret D. Howell, William M. Yanosy.

School of Dentistry, Washington University: Robert E. Bedell.

School of Dental and Oral Surgery, Columbia University: George A. Smith, Jr.

School of Dentistry, Loyola University, New Orleans: Anthony Macaluso.

College of Dentistry, New York University: Julian S. Sachs, Nathan Wachtel.

School of Dentistry, Temple University: Thomas G. Jenkins, Samuel Kaplan, Louis C. Dengler, David S. Shelby, Richard S. Youngs, Oakley B. Davy, Jr., Edwin Bertoglio, George E. Erdmann, John G. Brill, Hubert A. Renden, Emil E. Krause, Dale F. Rasmusson, Robert E. Kulvin, Dominick F. Dire, George B. Madory.

Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania: Howard Grindlinger, Irwin B. Golden.

Chicago Announces Program for Dental Economics Course

The program for the study course in dental socio-economics, to be presented jointly by the Chicago Dental Society and the University of Chicago this fall, has been announced by the study course committee, Lon W. Morrey, chairman. The course, entitled "The Dentist in the Social Order," will consist of eight weekly sessions, from October 10 to November 28, to be held at the Palmer House. The program is under the direction of Joseph B. Lohman, associate professor and chairman of the department of sociology, American University, formerly assistant professor of sociology, the University of Chicago. Earl S. Johnson, assistant professor of social sciences, the University of Chicago, is associate director. The complete program follows:

October 10 (Robert W. McNulty, presiding): Dentistry and the Changing Order, Joseph B. Lohman; Problems of

Professional Personnel in Meeting the Demand for Enlarged Dental Service, H. H. Horner, secretary, Council on Dental Education of the American Dental Association.

October 17 (William P. Schoen, presiding): The Health of the American People, Earl S. Johnson; Dental Needs, Dental Demands and Dental Costs, Melvin L. Dollar, University of Michigan, School of Public Health.

October 24 (Harold B. Noyes, presiding): The Ability to Pay for Dental and Medical Care, Joseph B. Lohman; Prepayment Dental Plans, John R. Mannix, director, Chicago Plan for Hospital Care, Consultant to Methods of Payment Committee of the Council on Dental Health of the American Dental Association.

October 31 (Charles W. Freeman, presiding): Plans for Dental and Medical Care, Louis Wirth, professor of sociology and associate dean, division of social sciences, the University of Chicago; Dental Programs of Federal Agencies, F. V. Meriwether, Medical Director, United States Public Health Service, director, District 3.

November 7 (Robert G. Kesel, presiding): Health Service Plans Conducted by the Medical, Dental and Affiliated Groups, Louis Wirth; Proposals of the Council on Dental Health, American Dental Association, Allen O. Gruebbel, secretary, Council on Dental Health.

November 14 (Allen G. Brodie, presiding): Organization Through the Action of Consumer Groups—Receivers of Medical and Dental Care, Joseph B. Lohman; Past, Present and Proposed Health Legislation, Harold W. Oppice, member of the Board of Trustees, American Dental Association, professor of crown and fixed bridge prosthesis, Loyola University, School of Dentistry.

November 21 (George W. Teuscher, presiding): The Professions and Public Policy Concerning the Health Services, Earl S. Johnson; The Dental Profession's Obligation to the Public, Arno B. Luckhardt, professor of physiology, the University of Chicago, member of the Council on Dental Therapeutics of the American Dental Association.

November 28 (Leo W. Kremer, presiding): The Formulation of Public Policy Concerning the Health Services, Joseph B. Lohman; Organized Dentistry's Responsibility in the Formulation of Health Service Plans, Harold Hillenbrand, Editor, JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

Tickets for the course will be $9 and can be obtained through the Chicago Dental Society, 30 North Michigan Ave., Chicago 2, Ill.

Three Dentists Needed for Work in Labrador

The International Grenfell Association, serving the Labrador and North Newfoundland coasts, needs three resident dentists. Duties are largely performed at cottage hospitals or the main hospital, St. Anthony, but involve outport trips by motor launch or dog teams. The salary is $500 per year plus maintenance and travel. A good range of operative, prosthetic and surgical work is possible. Young unmarried men are preferred and dental officers returning from military service would be particularly suitable. Dental care is more needed than usual in view of war time arrears and the increased fishing population now in the area. Apply to the Staff Selection Committee, International Grenfell Association, 156 Fifth Avenue, New York, N. Y.

Benefactor of Honolulu Dental Infirmary Dies

Helen Strong Carter, founder and benefactor of the Honolulu Dental Infirmary, died May 28 in San Francisco. Mrs. Carter's endowment of $1,000,000 to the infirmary in 1920 was but one of

her gifts offered in the interests of dentistry. The Strong Memorial Hospital in Rochester, N. Y., was founded and endowed by Mrs. Carter and her sister, Mrs. Gertrude Achilles. The Strong-Carter Dental Clinic at Palama Settlement, Honolulu, Hawaii, was financed by the Strong Foundation, created by Mrs. Carter. She was also interested in children's dentistry and the dental hygienists' program. The University of Hawaii receives annually from the foundation $5,000 in support of dental hygiene training.

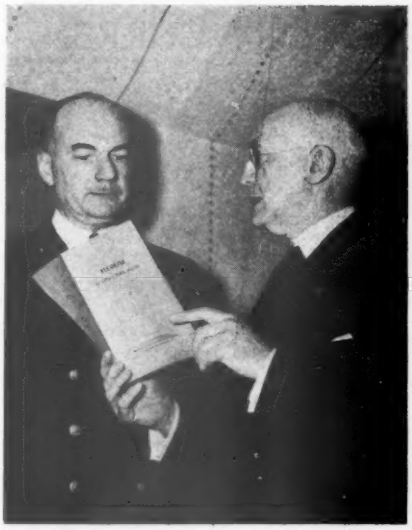
Mrs. Carter was elected an honorary member of the American Dental Hygienists' Association in 1927 and an honorary member of the Hawaii Territorial Dental Society in 1941, and was awarded the honorary master of arts degree from the University of Hawaii in 1940.

New York Institute Launches Fluorine Educational Program

A program to interest dentists in the importance of fluorides in dental health was launched by the New York Institute of Clinical Oral Pathology June 5 at a luncheon held in New York City. A booklet, "Fluorine in Dental Public Health," has been mailed by the institute to every dentist in the United States.

Arthur H. Merritt, Past President of the American Dental Association, speaking before the group of dentists and public health officials, declared that important evidence as to the effectiveness of fluorinating public water supplies would be accumulated as the result of experiments being conducted by the State Department of Health at Newburgh and Kingston, N. Y. Other speakers were William J. Gies, past president of the American College of Dentists, and David B. Ast, dental director of the New York State Department of Health.

Among those attending the luncheon were: Irving R. Hardy, George S. Callaway, Frederick Pfeiffer, Joseph J. Obst, Frank A. Calderone, Capt. C. V. Rault, Percy T. Phillips, Waldo H. Mork, Isadore Hirshfeld, Herman L. Reiss, M. L. Rosoff, Lester H. Cahn, Stanley G. Standard, J. A. Salzmann, Cmdr. William McGill Burns, J. L. T. Appleton, Harry Strusser, Theodore Kaletsky, Theodor Blum and E. Rogers.



Capt. C. V. Rault and Dr. Arthur H. Merritt examine pamphlet on "Fluorine in Dental Public Health."

Hermann Becks Appointed to Lecture in Guatemala

Hermann Becks, professor of dental medicine at the University of California College of Dentistry, has been appointed a visiting professor of the United States to Guatemala by the U. S. State Department. Dr. Becks will lecture at the National University of San Carlos in Guatamala City on dental medicine and the prevention of dental diseases. Through its Division of Cultural Cooperation, the U. S. State Department has recently sent numerous scientists to lecture before university groups in South America.

CURRENT LITERATURE

Disturbance of the Function of the Salivary Glands. A. C. Furstenberg and Elizabeth Crosby. Ann. Otol., Rhin. & Laryng. 54:243, 1945.

Dysfunction of the salivary glands may be either pyschogenic or organic. In addition to partial impairment of salivary activity through gross or microscopic pathologic alteration of glandular tissue, widespread dysfunction of the salivary mechanism may result from some impairment of the nerve supply to the glands. The dysfunction appears to be the result of end-organ lesions of the peripheral secretory nerves. This fact seems to be substantiated by the prompt physiologic action of the mechanism of salivation after the administration of pilocarpine. The effect of the drug is augmented by the simultaneous ingestion of the acid-forming salt, ammonium chloride. The institution of this treatment for a period of three to six weeks has been followed in some patients by a return to normal salivation. Although the exact mechanism is not clear, either spontaneous cellular regeneration or medicamentous stimulation of the salivary glands may favor an adjustment to normal function. Organic lesions of the central nervous system may also be implicated in salivary gland dysfunction, but are associated conspicuously with paralysis of other cranial nerves.—*R. P. Likens.*

Changes in the Oral Mucosa Accompanying Acute Pantothenic Acid Deficiency in Young Rats. W. W. Wainwright and Marjorie M. Nelson. Am. J. Orthodontics 31:406, July 1945.

Rats fed a purified diet deficient in pantothenic acid were examined histologically for possible changes in the oral mucosa. Those animals placed on the diet from the day of birth exhibited progressive necrosis of the oral epithelium and subsequent destruction of the underlying connective tissue, characterized by a consistent lack of inflammatory response. Those placed on the deficient diet from weaning also showed this typical epithelial necrosis. The latter changes occurred on supplemental basal diets high in either fat or carbohydrate and in spite of deferral of the deficiency.—*R. C. Likens.*

Rickets in Iceland. Dungal Niels. Am. J. M. Sc. 210:70, July 1945.

A survey made on 253 Iceland children between 3 months and 2 years of age by means of clinical and roentgen-ray examinations revealed a 77 per cent incidence of rickets. Signs of cranial rickets were found in at least 54 per cent of children examined. These results set at naught the widespread belief that rickets is unknown in Iceland.—*Paul H. Keyes.*

Chemotherapeutic Adjuncts in the Treatment of Necrotic Gingivitis. A. H. Horowitz and S. L. Horowitz. Mil. Surgeon 97:112, August 1945.

In a review of fifty chemotherapeutic agents used in treatment of Vincent's infection, the authors stress that these medicaments are merely adjuncts to general periodontal treatment. They claim no single agent fulfils all the requirements desirable for a specific in necrotic gingivitis. From their survey of the literature, the authors recommend copper sulfate solution, arsphenamine, mapharsen, aqueous iodine solution, tincture of metaphen and bismuth sodium tartrate for best results.

No mention of or reference to recent reports on the use of penicillin in treatment of oral fusospirochetosis is made.—*Paul H. Keyes.*

Penicillin Packs in the Treatment of Vincent's Infection. R. Thaxton and P. K. Dick. Brit. D. J. 78:292, May 1945.

In a preliminary statement, the authors report excellent results in the treatment of Vincent's infection by packing infected areas with a paste of penicillin powder mixed with magnesium oxide and olive oil and incorporating small wisps of cotton-wool.

Patients became asymptomatic in twenty-

four hours. In most cases, sloughs separated before thirty-six to forty-eight hours. Epithelizing was observed in four to five days. No packing was done after five days. Smears were negative for fusospirochetal organisms in four to five days.

Two patients successfully treated with penicillin were undergoing treatment for syphilis with intravenous arsenicals and exhibited the most severe form of ulcerative gingivitis. One of them had received sporadic treatment with chromic acid for six months.—*Paul H. Keyes.*

Fracture of the Mandible Associated with Burns of the Head: Report of Case. T. W. Karnes. J. Oral Surg. 3:83, January 1945.

Karnes uses an ingenious device to provide anchorage for rubber traction upon displaced fractures, composed of wires soldered to a metal labial arch bar. The arch is fastened to the upper teeth and the protruding wires are jointed at an apex a few inches in front of the upper teeth and in the same plane. From this vantage point, a rubber band can be fastened to any fragment on the lower jaw and the piece can be dragged forward. A plaster headcap is avoided by the employment of this device.—*J. Orton Goodsell.*

Sulfonamides in Oral Medicine. Joseph P. Osterloh. J. Oral Surg. 3:60, January 1945.

Osterloh reports his experiences with the sulfonamides, which he finds remarkably effective against bacteria identified with oral sepsis. Their simultaneous use with other drugs or anesthetics is not contraindicated, but large amounts of procaine should not be employed. Magnesium sulfate cathartics should not be used during sulfonamide administration, nor should ultraviolet therapy or prolonged exposure to sunlight be tolerated. X-ray therapy is inhibited by sulfatherapy. Because of the predominance of streptococci in oral infections, the author is led to prefer sulfanilamide to the others when the type of organism is not known. Sulfathiazole is indicated for staphylococci and acute osteomyelitis, although sulfadiazine works as effectively. Sulfanilamide was given for 121 days in actinomycosis before a cure was felt to be accomplished. In cellulitis, sulfanilamide "knocks" the infection quite promptly many times, but if this does not occur, the author shifts to sulfadiazine on the assumption that the organism is the staphylococcus. Blood levels should be adequately maintained. In children 1½ to 2 grains per pound of body weight is the standard dose for a twenty-four hour period, divided and given every four to six hours. Full dosages are maintained throughout treatment in order to prevent development of drug-resistant organisms. Osterloh found the sulfonamides of no benefit in Vincent's infection. Unlike many observers, he feels that sulfonamides are of no use in extraction sockets. Those with congenital heart disease or a history of rheumatic fever receive prophylactic amounts of sulfathiazole before extraction of teeth.—*J. Orton Goodsell.*

Flow and pH Changes of Submaxillary Saliva Associated with Variations in Acid-Base Equilibrium. Charles R. Brassfield. Am. J. Physiol. 144:43, June 1945.

In a study of the effects of intracellular acidity as reflected by changes in the saliva pH on the rate of saliva secretion, the author found that dogs receiving a continuous injection of pilocarpine will, with overventilation, have an increase in the pH of both blood and saliva. With low oxygen in a mixture containing carbon dioxide approximating the tension of this gas in the arterial blood, a decrease of pH in saliva and arterial blood is obtained. Since increased salivary flow accompanies the decreased salivary pH, but precedes the blood pH decrease, the increased secretion is attributed to the increased intracellular activity.

The effect of administering air containing more than 8 per cent carbon dioxide is to produce initially a greater pH decrease in blood than in saliva. A further increase is obtained on returning the animal to room air. With a lower carbon dioxide concentration, only increases in the salivary pH are produced.

When large amounts of lactic acid are injected, parallel decreases in both blood and saliva are obtained, but, with small or slow injections, an increase in salivary pH may be produced. Sodium bicarbonate injections usually produce an increase in saliva pH

which is much less than the pH increase in the blood. Ammonium chloride injections produce much greater decreases in pH of saliva than in pH of blood.

From the results, the author concludes that saliva flow changes are related to variations of intracellular acidity rather than to the reaction of either blood or saliva. It is suggested that the enhancement of flow by an increase in intraglandular acidity is the result of the inhibition by a decrease in pH of the rate of destruction of acetylcholine released at activated nerve terminals.—*S. Wah Leung.*

Balances of Fluorine Ingested from Various Sources in Food and Water by Five Young Men. F. J. McClure, H. H. Mitchell, T. S. Hamilton and C. A. Kinser. J. Indust. Hyg. & Toxicol. 27:159, June 1945.

Fluorine balances were studied in five young men ingesting fluoride in various forms in food and drinking water. Fluorine losses were measured in urine, feces, insensible perspiration and sensible sweat. The elimination of absorbed fluorine via the urine and perspiration is practically complete when quantities ingested do not exceed 4.0 to 5.0 mg. daily. Sweat seems to be an important avenue for fluorine elimination, containing 0.3 to 1.8 parts per million during periods of ingestion.

These data suggest that this amount of fluorine may be ingested without hazard of body storage and are evidence that any drinking waters which contribute not more than 3.0 to 4.0 mg. of fluorides daily to the ingesta are not liable to create endemic cumulative toxic fluorine.

At low levels of intake, the absorption of fluorine is largely dependent on the solubility of the supplement and in the case of calcium fluoride on the method of administration, in solution or in solid form.

Fluoride ingested in food in the form of bone meal, cryolite and calcium fluoride in quantities up to 3.0 mg. daily were largely eliminated from the young adult body. Apparently, cryolite spray residue on apples and pears, when consumed in quantities of 3.0 mg. or less daily, do not entail a hazard of toxic fluorosis.—*Paul H. Keyes.*

Effects of Dietary Deficiencies upon the Oral Structures. Isaac Schour and Maury Massler. Physiol. Rev. 25:442, July 1945.

The oral tissues, because of their sensitivity to nutritional deficiencies and dietary aberrations, have been called the barometer of the state of nutrition of the body. The routine examination of the teeth, the gums, the tongue, the lips and the saliva at periodic intervals is believed to be a simple and fairly accurate method of determining the nutritional status of both the child and the adult.

With this thought in mind, the authors discussed the effects of deficiencies of various dietary constituents upon the oral and dental structures with special reference to the deviations from the normal clinical pictures of growth and development.—*S. Wah Leung.*

Penicillin Treatment of Oral Inflammations in Childhood. M. B. Marks. J. Pediat. 26:582, June 1945.

Penicillin administered topically or by injection is reported to have been used successfully in the treatment of two cases of thrush, two cases of Vincent's infection and one case of herpetic stomatitis in young children. Parenteral administration of the drug resulted in somewhat more rapid cure than topical application.—*Paul H. Keyes.*

Congenital Bone Anomalies. George W. Christiansen and James S. Bradley. J. Oral Surg. 3:74, January 1945.

Christiansen and Bradley discuss oral, congenital bone anomalies. "Removal of these growths, termed torus palatinus or torus mandibularis according to their location, is usually advisable for one or more of the following reasons: (1) to facilitate prosthetic work; (2) to overcome a cancer phobia on the part of the patient; (3) to prevent interference with speech from impingement on the tongue; (4) to prevent the overlying soft tissues from being irritated and thinned out because of their size and position, and (5) to avoid packing of sticky foods into the interlobular spaces." The differential diagnosis and technic of removal of these bony masses is well illustrated and described.—*J. Orton Goodsell.*

DEATHS

Beers, Lloyd Y., assistant medical director in charge of the Dental Division, United States Veterans Administration, died July 11 in Washington after a brief illness. He was 58 years old. Dr. Beers was graduated from George Washington University in 1911. During World War I, he served as chief of the dental service at a base hospital at St. Nazaire, France. He entered the U. S. Public Health Service in 1919 and in 1925 became chief of the Dental Division of the Veterans Administration.

Pippin, Bland Nixon, professor emeritus of Clinical Dental Medicine at Washington University, St. Louis, died July 7 after a long illness, aged 71. He was graduated from Washington University in 1900 and was appointed an instructor in clinical dentistry. He continued teaching for forty-three years, retiring in June 1944. He was a member of the American Dental Association, Omicron Kappa Upsilon, the Missouri State Dental Association and the St. Louis Dental Society.

Allen, Frederick, Philadelphia, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1899; died July 25; aged 78.

Archer, Everett B., Halls, Tenn.; University of Tennessee, College of Dentistry; died in New Guinea, January 18. Dr. Archer was a major in the U. S. Army Dental Corps.

Barnett, T. Dawson, Toledo, Ohio; Northwestern University Dental School, 1906; died July 30; aged 65.

Berendsohn, Edward H., Brooklyn, N. Y.; New York College of Dentistry, 1893; died August 15; aged 73.

Berry, Walter H., Belvidere, Ill.; University of Illinois, College of Dentistry, 1905; died March 3; aged 67.

Bishop, Charles Blaine, Waynesboro, Pa.; University of Maryland, School of Dentistry and the Baltimore College of Dental Surgery, 1925; died August 5; aged 46.

Blickenstaff, William, Monticello, Ind.; Indiana University School of Dentistry, 1900; died May 12.

Brown, William Culp, Oak Park, Ill.; Northwestern University Dental School, 1892; died August 1; aged 79.

Cawthon, Harley, Tampa, Fla.; died July 23; aged 64.

Chambers, Charles C., Springfield, Mo.; died June 21; aged 74.

Chichester, Thomas A., Whitehaven, Tenn.; Vanderbilt University, School of Dentistry, 1914; died at Kennedy General Hospital, Memphis, July 1. Dr. Chichester was a lieutenant colonel in the U. S. Army Dental Corps.

Christiansen, Hubert F., Salt Lake City, Utah; died August 12; aged 62.

Christy, Chester W., St. Louis, Mo.; died July 13; aged 36.

Colby, Charles C., Lincoln, Nebr.; State University of Iowa, College of Dentistry, 1895; died August 4; aged 75.

Copple, P. R., Fullerton, Nebr.; Northwestern University Dental School, 1902; died June 23; aged 68.

Eaton, John Hancock, Roslindale, Mass.; Tufts College Dental School, 1906; died July 21; aged 82.

Fink, Paul M., Buffalo, N. Y.; died in the Canal Zone, May 2. Dr. Fink was a captain in the U. S. Army Dental Corps.

Frank, Meyer M., New Castle, Pa.; University of Pittsburgh, School of Dentistry, 1922; died at sea in an American area, March 16. Dr. Frank was a captain in the U. S. Army Dental Corps.

Gallagher, John W. S., Winona, Minn.; University of Minnesota, College of Dentistry, 1897; died July 7; aged 69.

Gardner, John T., San Bernardino, Calif.; died at A. S. F. Regional Hospital in Pasadena, June 17. Dr. Gardner was a captain in the U. S. Army Dental Corps.

Gochenour, William E., Portage, Wis.; Ohio College of Dental Surgery, Dental Department of the University of Cincinnati, 1888; died July 9; aged 85.

Guerne, Alfred A., Guerneville, Calif.; Northwestern University Dental School, 1902; died July 7; aged 78.

Haen, Leonard A., St. Cloud, Minn.;

killed in action June 16 in the Pacific area. Dr. Haen was a captain in the U. S. Army Dental Corps.

Hamilton, William T., Roseville, Calif.; died July 22 at Hammond General Hospital, Modesto, Calif. Dr. Hamilton was a captain in the U. S. Army Dental Corps.

Hamlet, Francis Peck, Hempstead, New York; Baltimore College of Dental Surgery, 1884; died August 6; aged 82.

Harlan, Yantis H., Bonham, Texas; died at Long Beach, Calif., April 4. Dr. Harlan was a major in the U. S. Army Dental Corps.

Hartzell, George W., Rochester, N. Y.; Pennsylvania College of Dental Surgery, 1895; died August 23; aged 75.

Hatfield, Gordon B., Lewiston, Me.; Tufts College Dental School; died July 30; aged 70.

Hauk, William Eslen, Duquesne, Pa.; Pennsylvania College of Dental Surgery, 1901; died July 21.

Holaday, Wiliam N., Highand Park, Mich.; Washington University School of Dentistry, 1912; died July 25; aged 60.

Humfreville, George B., Kewanee, Ill.; Kansas City Dental College, 1900; died July 23; aged 74.

Idler, Percy B., Wilmette, Ill.; Northwestern College of Dental Surgery, 1900; died Sept. 3; aged 69.

King, Ralph C., Sharon, Pa.; University of Pittsburgh, School of Dentistry, 1903; died August 7; aged 62.

Koehler, William J., Kansas City, Mo.; Kansas City Dental College, 1915; died July 16; aged 53.

Kolar, Otto J., Chicago, Ill.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1901; died in August; aged 65.

Kowalske, Oscar C., Annandale, Minn.; killed in action in the Pacific area, December 15, 1944. Dr. Kowalske was a major in the U. S. Army Dental Corps.

Laragay, Edwin J., Paterson, N. J.; killed in action in the Pacific area, December 15, 1944. Dr. Laragay was a captain in the U. S. Army Dental Corps.

Lawler, Emmett J., Norfolk, Va.; Baltimore College of Dental Surgery, 1901; died July 14; aged 58.

Ledwon, Joseph V., Youngstown, Ohio; University of Pittsburgh, School of Dentistry, 1927; died July 29; aged 42.

Ley, William B., Elizabeth, N. J.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1906; died July 26.

Lopizich, Val Martin, Bakersfield, Calif.; died June 29; aged 42.

Lord, John, Palmyra, N. J.; Temple University School of Dentistry, 1907; died July 26; aged 65.

Loring, Ernest L., Berkeley, Calif.; Kansas City Dental College, 1900; died July 26.

McBride, John C., Spokane, Wash.; died in Baxter General Hospital, Spokane, June 1. Dr. McBride was a lieutenant colonel in the U. S. Army Dental Corps.

McCarthy, James J., Olean, N. Y.; University of Michigan, College of Dental Surgery, 1913; died August 8; aged 52.

McGuire, J. W., Victor, Iowa; State University of Iowa, College of Dentistry, 1909; died August 6.

McTyeire, R. P., Bessemer, Ala.; Birmingham Dental College, 1897; died July 1; aged 46.

Marchant, August Melvin, Mathews, Va.; Baltimore Medical College, Dental Department, 1898; died July 17; aged 67.

Massart, George, Appleton, Wis.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1899; died July 24; aged 69.

Middleton, George W., San Francisco, Calif.; College of Physicians and Surgeons of San Francisco, School of Dentistry, 1915; died July 8.

Miller, Erwin A., Norwalk, Calif.; Marquette University School of Dentistry, 1918; died June 15; aged 49.

Millgard, M. L., Spokane, Wash.; North Pacific College of Oregon, School of Dentistry, 1908; died July 16; aged 62.

Morris, Emile H., San Francisco, Calif.; College of Physicians and Surgeons of San Francisco, School of Dentistry, 1906; died August 4; aged 61.

Morse, Ralph W., Lansing, Mich.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1899; died July 18; aged 85.

Munson, Arthur, Sparkill, N. Y.; New York College of Dentistry, 1910; died August 13; aged 65.

Musgrave, Charles A., Defiance, Ohio;

Ohio College of Dental Surgery, 1905; died April 24; aged 68.

Nelson, Robert V., Minneapolis, Minn.; University of Minnesota, College of Dentistry, 1928; killed in action in the Pacific area, December 15, 1944. Dr. Nelson was a major in the U. S. Army Dental Corps.

Newcomb, W. E., Cleveland, Ohio; Ohio Medical University, College of Dentistry, 1902; died July 11; aged 67.

Newcome, Howard, Punxsutawney, Pa.; died June 25; aged 39.

Olson, L. C., St. Croix Falls, Wis.; University of Minnesota, College of Dentistry; died June 25; aged 39.

Orr, Clark, Miami, Fla.; Northwestern University Dental School 1900; died July 27; aged 76.

Osborn, H. W., Odessa, Mo.; Kansas City Dental College, 1906; died July 11.

Osmanski, Frank E., Nanticoke, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1911; died June 26; aged 57.

Parker, Charles H., Santa Cruz, Calif.; Columbian Dental College, Chicago, 1895; died June 23; aged 75.

Pederson, Carl N., Oak Park, Ill.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1911; died July 10; aged 65.

Phillips, Percival, Salem, Mass.; Tufts College Dental School, 1897; died June 14; aged 68.

Prince, Frank R., Stockton, Calif.; College of Physicians and Surgeons of San Francisco, School of Dentistry, 1917; died June 7.

Proctor, Minnie M. S., Los Angeles, Calif.; University of Southern California, College of Dentistry, 1902; died June 13; aged 64.

Ratcliff, John R., Jasper, Texas; died June 2; aged 85.

Richmond, William J., Cincinnati, Ohio; Cincinnati College of Dentistry; died July 10; aged 65.

Ringhoffer, Edward M., Portland, Ore.; North Pacific College of Oregon, School of Dentistry, 1907; died July 22; aged 59.

Roberts, C. A., Austin, Minn.; died July 12; aged 59.

Robertson, Bedford Forrest, Kingsport, Tenn.; died August 11; aged 52.

Rose, Robert V., Lakewood, Ohio; Ohio State University, College of Dentistry, 1900; died April 3; aged 66.

Schlenker, Eda B., Rochester, N. Y.; University of Michigan, College of Dental Surgery, 1914; died July 18; aged 58.

Schmadel, A. E., Lafayette, Ind.; Ohio College of Dental Surgery, Dental Department of the University of Cincinnati, 1897; died June 19; aged 74.

Seeger, Robert W., Springfield, Ohio; Western Reserve University School of Dentistry 1933; killed in action in the South Pacific, May 11; aged 43. Dr. Seeger was a lieutenant in the U. S. Naval Dental Corps.

Shaver, William H., Madelia, Minn.; Minnesota College Hospital Dental Department, 1886; died July 23; aged 87.

Shumway H. S., Columbus, Ohio; Ohio Medical University, College of Dentistry, 1907; died July 17; aged 60.

Siegel, David, Boston, Mass.; Harvard University Dental School, 1910; died in May.

Smedley, Ernest W., Bountiful, Utah; Western Dental College, Kansas City, 1903; died June 2; aged 78.

Smith, Frederick C., Rochester, N. Y.; University of Buffalo, School of Dentistry, 1913; died June 18; aged 54.

Smith, Walter H., Minneapolis, Minn.; University of Minnesota, College of Dentistry, 1906; died August 4; aged 65.

Sofield David, Denville, N. J.; Temple University School of Dentistry, 1901; died August 12.

Sowle, Charles J., Rockford, Ill.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1895; died June 28; aged 76.

Stehouwer, Orrie W., Galveston, Texas; University of Michigan, College of Dentistry, 1932; died July 15; aged 35.

Stoner, Rex R., Lost Nation, Iowa; State University of Iowa, College of Dentistry, 1918; died June 24; aged 52.

Strozier, Frank F., Houston, Texas; Texas Dental College, 1913; died May 22; aged 55.

Taylor, Victor H., Utica, N. Y.; New York College of Dentistry 1923; died August 7; aged 45.

MEETINGS AND ANNOUNCEMENTS

American Society for the Advancement of General Anesthesia in Dentistry, New York, N. Y., October 22. M. Hillel Feldman, 730 Fifth Ave., New York, N. Y., Executive Secretary.

Montreal Dental Club Annual Fall Clinic, October 24-26. M. L. Donigan, Drummond Medical Bldg., Montreal, Director.

Alabama: Dental Association, Birmingham, October 23-25. Angus M. Sellers, Empire Bldg., Birmingham 3, Secretary.

Arizona: State Dental Board, Phoenix, October 10. R. K. Trueblood, 25 N. Second Ave., Glendale, Secretary.

Connecticut: Dental Commission, Hartford, November 6-10. C. G. Brooks, 302 State St., New London, Recorder.

District of Columbia: Dental Society, Washington, second Tuesday of each month. J. Walter Bernhard, 1835 Eye St., N.W., Washington, Secretary.

Michigan: Detroit's Fourth Annual Dental Review, November 8. Raymond W. Walmoth, 4421 Woodward Ave., Detroit 1, Chairman.

New York: Greater Dental Meeting, December 3-5. Willard S. Bell, Room 106A, Hotel Pennsylvania, New York, Chairman, Press and Publication.

Ohio: State Dental Board, Columbus, October 22-24 (practical), October 25-27 (theory); hygienists: October 23 (practical), October 25-27 (theory). Earl D. Lowry, 79 E. State St., Columbus 15, Secretary.

State Dental Society, Columbus, November 11-12.

Oklahoma: State Dental Society, Oklahoma City, October 14-17. Eugene W. Wise, Medical Arts Bldg., Tulsa, Secretary.

Pennsylvania: Commonwealth of, Department of Public Instruction, Bureau of Professional Licensing, State Dental Council and Examining Board, Harrisburg, Pittsburgh, September 20-22 (clinical), October 15-17 (written). Reuben E. V. Miller, 61 N. Third St., Easton, Secretary.

Western, Odontological Society of, Pittsburgh, November 6-8. W. Earle Craig, Jenkins Bldg., Pittsburgh 22, Secretary.

South Carolina: State Dental Association, Columbia, October 14-16. E. G. Bumgardner, Columbia, Directing Secretary.

Wisconsin: State Board of Dental Examiners, Milwaukee, November 5-9. S. F. Donovan, Tomah, Secretary.

Internships, Externships, Residencies and Fellowships

Eastman Dental Dispensary, Rochester, N. Y. Director, Harvey J. Burkhart.

Research and Educational Hospital, University of Illinois Medical Center. Address Dean, University of Illinois, College of Dentistry, 808 S. Wood St., Chicago 12.

Richmond Freeman Memorial Clinic for Infants and Children, Dallas, Texas. Dora B. Foster, 3617 Maple Ave., Dallas, Executive Director.

Walter G. Zoller Memorial Dental Clinic, University of Chicago. Address Director, Walter G. Zoller Memorial Dental Clinic, University of Chicago, Chicago 37.

Carnegie Fellowships for Research and Graduate Work in the Dental Sciences, University of Rochester, George H. Whipple, Rochester, Dean.

Pathology, Dental and Oral, Fellowship in, Army Institute of Pathology. Address Director, American Registry of Pathology, Army Institute of Pathology, Army Medical Museum, 7th and Independence, S.W., Washington 25, D. C.

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